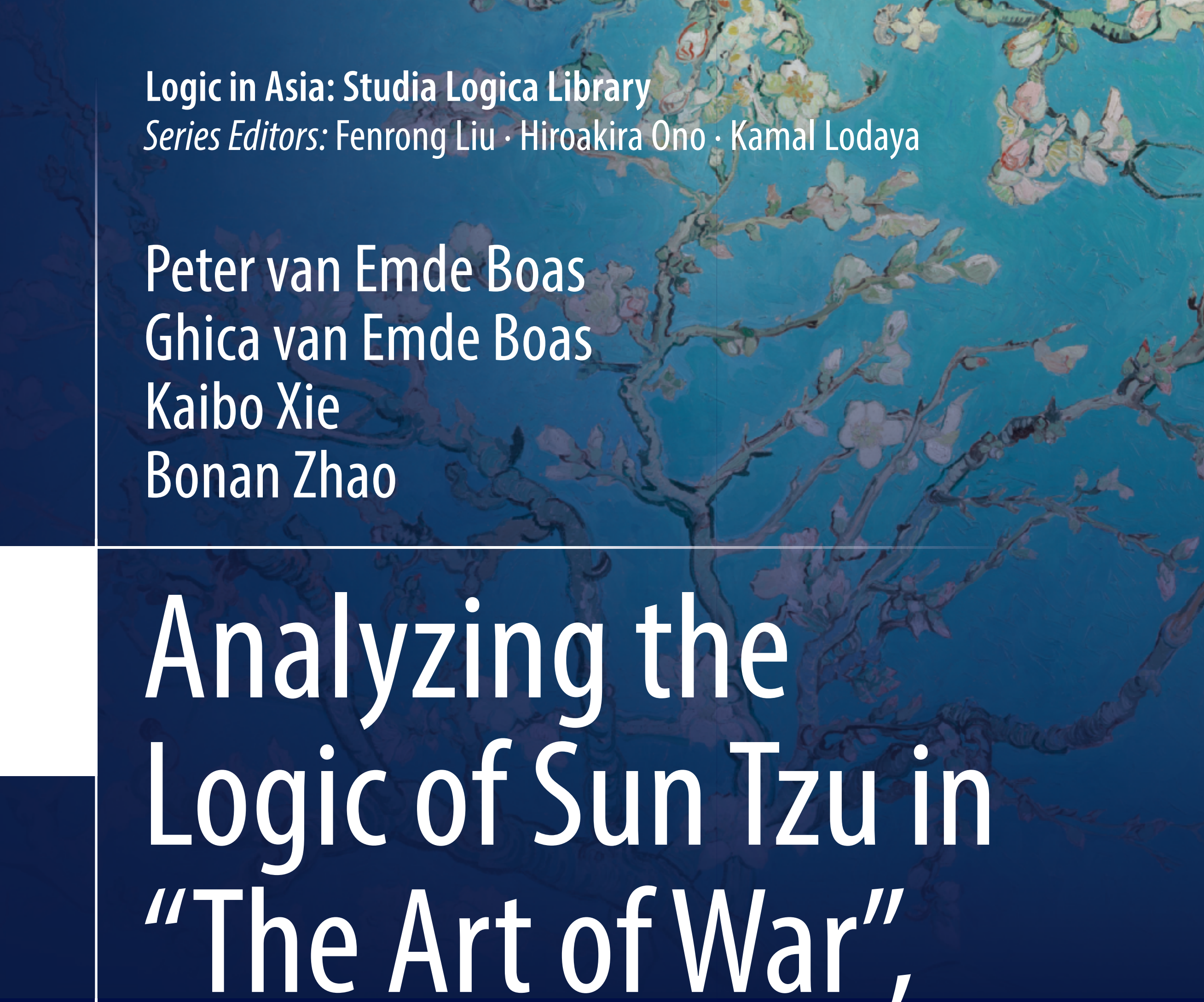

Logic in Asia: Studia Logica Library
Series Editors: Fenrong Liu · Hiroakira Ono · Kamal Lodaya

Peter van Emde Boas
Ghica van Emde Boas
Kaibo Xie
Bonan Zhao

Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps

Springer

Logic in Asia: Studia Logica Library

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Peter van Emde Boas · Ghica van Emde Boas ·
Kaibo Xie · Bonan Zhao

Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps

Springer

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Foreword

The book you have just opened is probably unlike anything you have ever read so far. It offers you a path to direct contact with “The Art of War”, the masterpiece of Sun Tzu, a classical theorist of warfare in Ancient China. You may even dimly know Sun Tzu quotes that have entered our cultural mainstream, such as his famous claim that successful generals win their battles before they even start.

Sun Tzu’s work was written in the middle of the first millennium BCE in pre- unification China. In this period many vibrant states vied and fought for power in a multi-centered political landscape that saw a proliferation of creative philosophical schools, and of cultural diversity and scientific achievement generally. But “The Art of War” also testifies to the elegant compactness of classical Chinese, which pervaded and unified this diverse cultural realm. The present book will introduce you to the content of Sun Tzu’s work and the thinking behind it, bringing together military science, logic and language, and to some extent, ancient Chinese culture.

War is a constant in human history, showing us at our most inhuman at times, yet at other times in supreme acts of selfless courage, sacrifice, and generosity. So much is at stake in war that a society learns by leaps and bounds, and innovations emerge of every sort: from better technology to better organization, and in Sun Tzu’s book: to deeper thinking. Thus, “The Art of War”has been translated the world over, making its way from academic circles of scholars to the open competitive world of modern business. This entry into a broader swath of society is not just a sideshow, since part of the methodology of the present book comes precisely from the latter contact.

Sun Tzu’s book stands in a long tradition of thinking about the art of war. Hellenistic and Roman authors wrote on the topic, so did medievals like Machiavelli, and people like me even have their cherished Von Clausewitz on their book-shelves, watching as I write the lines of this preface. But Sun Tzu offers a unique perspective of reflection on the thinking behind warfare that adds a further dimension to this military literature. It stresses out-thinking rather than outfighting one’s opponents, presaging - with some creative poetic licence in reading the text - notions from epistemology and game theory that only became clear in recent centuries.

Now over to the text lying before you. It was written by a unique team consisting of a theoretical computer scientist, a practical computer scientist operating in the business world, and two students of logic who also have direct acquaintance with classical Chinese. I doubt that any such team has ever attempted a task like this. The result of this collaboration is a striking source book.

This book offers a totally new way of representing ancient texts, using ’mind maps’. This visual tool for broad audiences, inspired by techniques in the business world, highlights the main meaning structures of a text in a faithful and illuminating manner. Using this method, the book then provides a systematic compendium of the logical patterns of statement in the ancient text (parallel, conditional, metaphorical, and so on) that reflect Sun Tzu’s thinking. These are the building blocks for the further types of reasoning to which “The Art of War” invites its readers. But there is more. You will also find the approach taken in this book informative on the linguistic structure of the classical Chinese language, since it contains careful discussions of how to best fit the vocabulary of the Chinese text to the authors’ mind maps.

A word of explanation may be needed for the word ’logic’ in the title of this book. This term has many meanings, from its ordinary language senses of coherent structure and cogent argument to the technical senses of logicians and computer scientists that involve formulas and sometimes run all the way to automation and AI. In this book, ’logic’ mainly refers to the coherent recurring patterns of statement identified by the authors in Sun Tzu’s text, no mean task in itself. There is little further analysis in the book of the reasoning that might be done with such patterns. The reason is that, on the whole, “The Art of War” does not provide sustained chains of argument, although the authors do identify where these might start.

Part I of this book explains the methodology employed by the authors, and it is the part that you can read as a continuous narrative. I have not described all its contents here, leaving you to discover other interesting themes by yourself. Some game theory is brought to bear: the claim that Sun Tzu discovered modern notions like higher levels of reasoning about others and game-theoretic equilibria turns out to be under-supported by the text. Also, a bit of embedding is provided of Sun Tzu’s thinking in the cultural outlook of the classical Chinese, and some non-warfare- related textual gems in “The Art of War” are highlighted. Parts II and III, containing the complete source material, are a compendium of chapter-by-chapter analyses in parallel English and Chinese versions that you can consult as the interest or the need strikes you. All parts taken together give a unique approach to Sun Tzu’s text, unlike existing translations or commentaries, bringing to life, as the authors say, the rhythm and visual quality of the original. Thus, you will get close to what the original text is actually saying, not obscured by a curtain of stylistic adaptation, literary embellishment, or philosophical interpretation.

In laying out the material in this way, this book establishes a platform for further uses. You can strike out from here and engage in deeper logical analysis of the theory suggested by Sun Tzu's work, make comparisons with other historical authors on the art of war, link up with the linguistic study of classical Chinese, or, if none of these are your thing, apply the author's mind mapping and pattern search approach to other ancient texts than that of Sun Tzu, and other topics than war.

The style employed in writing the present book is plain, direct and modest. I think of it as partly academic, and partly speaking to common sense in wider circles, in line with the outreach sought by the authors. Both academic scholars in various fields and a more general audience should be able to get something of value.

Finally, warfare reflects society and culture. I can only agree with what the authors say themselves. In bringing the actual text of the “Art of War” closer to us readers in their crisp new format, free from intrusive interpretations, they do something more. They also bring us closer to the birth of reflective thinking in ancient Chinese culture, which was to go on to produce so many of the wonders of the world.

Netherlands, January 2022 *Johan van Benthem*

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and co-director, UvA-Tsinghua Joint Research Center in logic.

Preface

This is *not* a book about war. In this book we examine an ancient Chinese work on strategy and warfare, written by Sun Tzu: *The Art of War*.

This famous work has been studied and translated many times before, from the perspective of history, military strategy, or business strategy. Some famous quotes are even used for modern computer strategy games.

We look at Sun Tzu's work from the perspective of logic, mathematics, and computer science. Making use of contemporary *mind mapping* methods, we show how logic can be extracted from this 2500 years old text. We believe that this has not been done before.

There are several reasons why you may be interested in this book. Perhaps you could find some inspiration for new ways to look at old text. Maybe you want to have a fresh look at the work of Sun Tzu from a new perspective: as a logician, as a linguist, as an interested layman, or as a business person. We tried to make the methods we used to be understandable and applicable to persons of many interests, and we tried to make the diagrams that explain our methods as readable as possible. Nevertheless, you may find that the fonts of some diagrams are almost too small to be readable. There is not much we could do about it, being bound to a small paper size. Enlarged versions of the major mind map diagrams can be found on our website [90].

What began as a not-so-serious exercise in mind mapping of chapter IV of *The Art of War* for the purpose of preparing a chapter for *the Handbook on the history of logic in China* [69], turned out to be a very useful tool to discover structure and patterns in the text. We developed the *Text Tree Mind Map (TTMM)* as a special kind of mind map, where a whole source text can be seen in two-dimensional form, and where it is possible to preserve the order of the text.

The original goal of the chapter in the handbook was to investigate connections between the ideas of Sun Tzu and (contemporary) logic, in particular, aspects related to game theory and theory of mind. When a first draft of this chapter was presented at the third meeting on the History of Logical Thought in China, in april 2014 in Tianjin, one of our colleagues observed that Sun Tzu is actually a logic text.

At that time we considered this to be a curious observation. However, using the Mind mapping techniques in this project, it became clear that the text has a logical structure, which is not well-preserved in the various translations. When we looked at the Chinese text in addition to the English translation, as recommended by Prof. Fenrong Liu, it turned out that the logical structure is even more prominent in the Chinese original.

This is the cause for the word *logic* in the title of this book. Of course there is more to this title than that, we hope this will become clear later.

We continued our research for the first six chapters in *The Art of War*, which resulted in a presentation at the conference *The Making of the Humanities VII, 2018*, and a website, `https://suntzu.squaringthecircles.com/`, which shows all mind maps and descriptions of the patterns for these chapters.

This book expands on the work for the conference in 2018 in several ways. It now covers all chapters of Sun Tzu's book. We made mind maps, not only of the English text, but also of the Chinese text. We also did a thorough search for patterns, using the mind maps. The Chinese mind maps were helpful in uncovering more patterns and finding problems in the translation.

The major patterns we found using our mind mapping methods are: **Enumerations, Pairs of Opposites**, and **Metaphors**. **Conditional Sentences**, or if-then-else type sentences, can be categorized as a set of patterns.

Although we tried to construct an exhaustive list of the patterns that we found in "The Art of War", such an effort can never be complete and there can never be a complete consensus about what we found. Especially, the area of *Conditional Sentences* could be a subject of further scientific work.

The mind maps, which we defined and named as *Text Tree Mind Maps*, enable us to bring back rhythm and visual structure of Sun Tzu's book which is obscured in many translations, because the translators tried to produce a narrative, instead of a literal translation. We hope that mind mapping methods can inspire others to find new ways of analyzing old text.

A new look at game theoretical aspects of Sun Tzu's text is also part of this book, although we consider this to be a good subject for further work, and therefore the description is not complete.

Our work is based on a translation made by Lionel Giles [23] in 1910, and on comparisons with the original Chinese text [91] both taken from the Gutenberg project, which provides old books and text without copyright to be freely used.

The creation of this book was a team effort by four authors, where each had an essential role:

Peter is the chief-scientist who contributed his knowledge about mathematics, theoretical computer science, logic, and game theory.

Bonan contributed the idea of looking for patterns in the text of Sun Tzu, and she described them. She also produced the Chinese versions of the mind maps.

Kaibo is responsible for topics related to ancient Chinese Logic and Linguistics. He looked at special Chinese characters and the special language constructs where they are used. Moreover, he contributed with a study about contradictions and its meaning in Sun Tzu's time.

With Bonan's and Kaibo's knowledge of classical Chinese we uncovered special language constructs and defined better translations.

The idea of making mind maps originated from Ghica. She also produced the LaTeXsources for the text and developed tools for creating a uniform look for the text and mind maps in all chapters.

In addition to these specific roles, each of us participated in lengthy discussions about all aspects of the book. Being located at three different locations in three different time zones made this not always easy.

This book is a spin-off of the Research Program *History of Logic in China*, within the *Tsinghua University – University of Amsterdam Joint Research Centre for Logic*. This Center provided the inspiration for the original Handbook project and helped to establish the contact between the European and the Chinese authors.

Amsterdam,
2022

Peter van Emde Boas
Ghica van Emde Boas
Kaibo Xie
Bonan Zhao

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Above all, we would like to thank Prof. Fenrong Liu, Tsinghua University, Beijing, and ILLC, University of Amsterdam. She suggested that we would continue work done earlier, mind mapping some chapters of SunTzu's *Art of War*, which will appear in the Handbook on the history of logic in China [69], expanding the scope to the full text of Sun Tzu's *The Art of War*. Prof. Fenrong Liu introduced us to our two co-authors, Bonan Zhao and Kaibo Xie.

Prof. Dr. Johan van Benthem, University of Amsterdam and Stanford University, had extensive and very helpful advice.

We thank the anonymous reviewers of the book for their supportive comments.

From various discussions about Sun Tzu and our mind-mapping methodology, we acknowledge Dennis de Champeaux for the useful comments about visualization, Joachim Gentz for his remarks about Fu Chao, Zhiqiang Sun for his help with antique Chinese, Evert van Emde Boas for his pointers to linguistic tools, Rineke Verbrugge for her discussions about theory of mind, and Yanjing Wang for our discussions in the early stages of this project.

We are indebted to the many translators of Sun Tzu's *The Art of War*, whose work we could build on. They had insightful comments about the origin and meaning of the text which we used to improve our mind maps and patterns. You can find a chapter about the translations here, see: Translations of The Art of War, on page 391.

Lionel Giles, the first serious translator of the Sun Tzu text into the English language (in 1910) and to `Gutenberg.org` for providing us with the text, both in English and in Chinese, free of copyright. This allowed us to use and modify the text as we saw fit.

The original translation to English of "The Art of War" that this book is based on, can be found here:

`http://www.gutenberg.org/ebooks/17405`, and is provided under the Gutenberg licence, to be found here:

`https://www.gutenberg.org/policy/license.html`.

Other essential websites for searching the English (Giles) and Chinese versions of Sun Tzu's book are: `https://www.yellowbridge.com/onlinelit/artofwar.php` and `https://ctext.org/art-of-war`.

The pictures in this book are from the Long Corridor in the Summer Palace in Beijing, China. They show scenes from the Romance of the Three Kingdoms [35]. The photos are made by Peter van Emde Boas in 2014.

The images from Leibniz's Characteristica Universalis and the tree of Porphyry in chapter Diagramming Ancient Text, on page 23, can be attributed to the Public domain, via Wikimedia Commons.

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Acronyms

AoW	Art of War. To avoid confusion with the book chapter numbers, we show the Art of War chapter numbers usually as: AoW Ch. nn, par. m, where nn is a roman numeral. So, for example *AoW Ch.VI, par. 11* would refer to “the Art of War”. chapter 6, paragraph 11. In addition, the book chapters are not numbered.
TTMM	Text Tree Mind Map. A mind map where the nodes contain text and where the tree which represents the mind map is ordered left to right and top to bottom.

Part I

The Logic of Sun Tzu

In this part we introduce Sun Tzu, and his book *the Art of War*, a famous 2500 years old text that discusses strategy of warfare.

We look at Sun Tzu's work from the perspective of logic, mathematics, and computer science.

We introduce what our research involves: using contemporary mind mapping methods, we show how logic and patterns can be extracted from this 2500 years old text.

The Art of War (from the Summer Palace in Beijing)

Introduction

Abstract In this book we are looking at Sun Tzu, *the Art of War*, an Chinese work on strategy and warfare from about 2500 years ago. We use a mind map representation to look at the logic used by Sun Tzu. This allows us to uncover logic patterns in a systematic way. In this chapter we try to answer some questions you may have about the usefulness of mind mapping, what the logic is that Sun Tzu uses, what logical patterns are, and which translation issues we tried to solve.

Contents of the Book

There are four parts in this book:

The **first part** starts with an overview introducing Sun Tzu, the contents of his book, *the Art of War*, and some notes on other books about war. The chapters that follow cover the making of mind maps, patterns, and logic as encoded in conditional sentences and argumentative structures.

This is followed by a chapter about Game Theory and a chapter with a perspective on future work.

The **second part** contains all the mind maps, grouped by chapters of *the Art of War*. Each chapter in this part contains a description of one chapter of *the Art of War* as follows: *a short description of the main subjects, a Chinese mind map, an English mind map, details and patterns*, and *English structured text*.

The details and patterns part contain mind maps fragments for each main subject, patterns for that subject, and sometimes explanations about the translation.

The structured text is text that tries to provide a rendering of the text in the same structure as the mind map, but easier to read.

The **third part** lists all patterns found, sorted by pattern type and by chapter in *the Art of War*. The list has references for each pattern to its occurrence in the specific Art of War chapter, where it may have more explanation.

The **fourth part** contains some miscellaneous subjects, such as specific information about terrain, as used in *the Art of War* and an overview of modern translations.

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Audience

Sun Tzu's ancient and famous book is popular in business and military circles today and there are many translations and studies made of it.

Scientists or translators studying Sun Tzu's book are generally looking from the perspective of history, military science, philosophy, or linguistics. The background of the authors of this study is quite different: mathematics, computer science, and logic. We think that this new perspective provides new insights, particularly about the logic used by Sun Tzu.

What we would like to achieve with this book is, to analyze the logic of Sun Tzu, in order to understand how people of three thousand years ago conducted rational thinking for a very intriguing and sophisticated situation, namely, *war*, when there were no modern tools of measurement, geography, maps, guns, or historical records available.

Amazingly enough, this book is still seen as a bible for business and military schools. What is the magic in Sun Tzu's reasoning, his way of reflection, that produced this great work? To understand the thinking methods Sun Tzu used under the restrictions of his time is the goal of our analysis.

The question arises then if this book is intended for text scholars, for logicians or for a wider public? We hope that this book is interesting for all of those.

Maybe this book is a source for scientists who would like to study the text of *the Art of War* in detail. Or, for scientists wanting to study other old texts and find out whether the mind map approach used here is feasible. We hope also to interest a larger public, non-logicians, such as economists, historians, and people interested in military or strategic matters. It is certainly possible to apply text tree mind mapping to other texts, following the steps outlined in section Procedure for Making a Mind Map, on page 36.

Logic and Mind Maps

The title of the book, *Analyzing the Logic of Sun Tzu in "the Art of War", Using Mind Maps*, probably makes you wonder what kind of *Logic* is meant here and how this can be related to *Mind Maps.*

Logic in Sun Tzu's time was very informal, and he described his logic in a rather abstract way. By uncovering logical *patterns* in his text, of which *enumerations* and *pairs of opposites* are the most prominent ones, we were able to highlight his reasoning better.

The **mind maps** are *not* semantic spider webs, nor a new kind of Tree of Porphyry, nor Venn diagram, nor UML (Unified Modeling Language), or the like. The mind maps are a new way to show text in a **structured** way, as a *text tree*, using mind mapping software. We call them **Text Tree Mind Maps**. A rigorous definition will follow later in chapter: The Making of a Mind Map, on page 33.

The Mind Map Method

Mind maps are used to uncover the structure of the text of *the Art of War*.

It may cause confusion that generally mind maps are seen as *semantic* diagrams, while in this book they are foremost used as **structural** text trees. This may help to uncover the semantics of the text though.

Text Representation

To illustrate the power of this structural representation, we give an example here from *the Art of War*, chapter V, paragraph 6, in the translation to English by L. Giles [24].

In medieval time people would write book pages that could have looked like this:

> *indirecttacticsefficientlyapplied*
> *areinexhaustibleasheavenandearthun*
> *endingastheflowofriversandstreams*
> *likethesunandmoontheyendbuttobegin*
> *anewlikethefourseasonstheypassaway*
> *toreturnoncemore*

The text would probably be spoken aloud which would make the punctuation clear, and consequently its meaning.

In Chinese, our example text would look like the fragment below, but for convenience placed horizontally here, while text on old bamboo strips would usually be placed vertically:

> 故善出奇者无穷如天地不竭如江河终而复始日月是也死而复生四时是也

Because each character describes a whole word, in Chinese the structure would be easier to see. Certainly, the text would be mostly spoken instead of read, also because not to many people could read at that time.

Later, when books became a commodity and people would read in silence, the same English example text could look like this:

> 6. Indirect tactics, efficiently applied, are inexhaustible as Heaven and Earth, unending as the flow of rivers and streams; like the sun and moon, they end but to begin anew; like the four seasons, they pass away to return once more.

This is similar to the representations of this text as we find it today in books or on the web.

When we apply our mind map method, we would render the text as in figure 1.

We hope that you can see some structure and meaning emerge from this mind map snippet, although it contains exactly the same text. It becomes clear that Sun Tzu uses an informal enumeration of four elements to describe his *indirect tactics*: heaven and earth, rivers and streams, sun and moon, four seasons. We hope that this helps to recognize that mind maps can add understandability and show semantics to otherwise not easily accessible text.

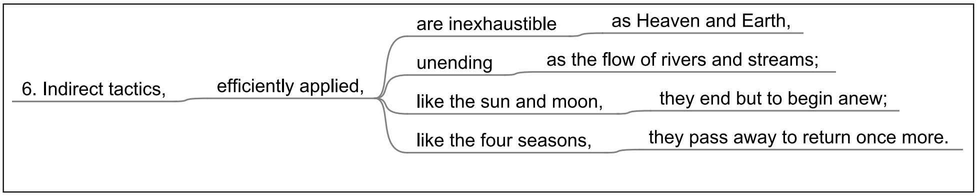
6. Indirect tactics,
efficiently applied,
are inexhaustible
as Heaven and Earth,
unending
as the flow of rivers and streams;
like the sun and moon,
they end but to begin anew;
like the four seasons,
they pass away to return once more.

Fig. 1: AoW Ch. V, par 6: Indirect Tactics, English - original text

Uncovering Translation Problems

Let us take one more step:

In figure 2, we show a Chinese and an English mind map of the same text together. If you look carefully at the English text, you see that the order of the first and second part of the last two sentences is reversed compared to the text in figure 1.

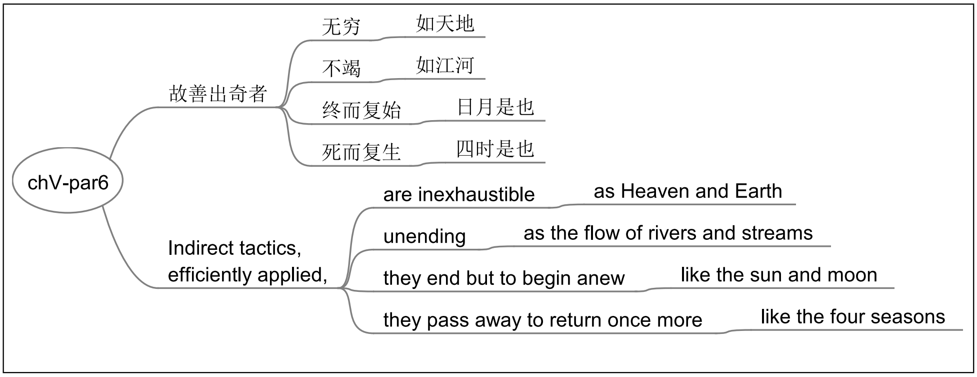
chV-par6
故善出奇者
无穷
如天地
不竭
如江河
终而复始
日月是也
死而复生
四时是也
Indirect tactics, efficiently applied,
are inexhaustible
as Heaven and Earth
unending
as the flow of rivers and streams
they end but to begin anew
like the sun and moon
they pass away to return once more
like the four seasons

Fig. 2: AoW Ch. V, par 6: Indirect Tactics: Chinese and adapted English text

The Chinese version of the mind map shows that there are four metaphors here: heaven and earth (天 and 地), rivers and streams (江 and 河), sun and moon (日 and 月), and four seasons (四时): in the English version the first two aspects start with their explanation, and the last two start with the metaphor; in Chinese version the structure of all four aspects appear in the same order: the explanation first and then the metaphor.

To bring the English translation in line with the Chinese original, we changed the text as in the bottom part of the mind map in figure 2.

In this case we saw the discrepancy in the English text first and then checked the Chinese version, to find the problem with the translation.

In a nutshell we described how *mind maps* can make text more understandable, allow patterns to be uncovered, and show how the translation can be improved. Mind maps are an *informal* way of analyzing *informal* text. You cannot enforce the rigidity of, for example, a programming language onto the text. Being not precise is precisely the power of mind mapping.

Introduction to the Process of Making a Mind Map

A final question you may have about the how and why of mind mapping is: what is the process to make these mind maps? We will cover this subject in more detail in chapter The Making of a Mind Map, on page 33, but here is a short overview:

Making an initial mind map is a very simple process. Start by splitting the text at paragraphs, sentences, comma's, question marks and so on. The resulting text is pasted into a suitable mind mapping program. We edited the original example text (from the Giles translation) like this:

```
6. Indirect tactics,
    efficiently applied,
        are inexhaustible
            as Heaven and Earth,
        unending
            as the flow of rivers and streams;
        like the sun and moon,
            they end but to begin anew;
        like the four seasons,
            they pass away to return once more.
```

For a small example this is fine, however, for the whole book we developed some scripts to do the editing for us.

To put the edited text into a mind map, we use Freemind[20], a free and open source mind mapping tool. Just select the text you want to mind map in your text editor, copy the text to the clipboard, create a new mind map in Freemind and paste your text. Using our example, you would see a mind map as in figure 1.

Once a mind map is made using these basic structuring principles, the hard work begins. Discussions, comparisons between the Chinese and the English version, and looking at special Chinese characters, one can find structure, and make groupings into topics and subtopics.

Patterns

When Sun Tzu talked about his warfare strategies, it was more like a collection of tips and reflections from a diligent thinker. He did not develop a systematic theory of war and then used evidence to support his argument, nor did he start with a set of principles and then derived complicated recipes.

A primary means of describing his argumentation are the many *enumerations* of circumstances, adequate advice given for particular situations, and some almost basic calculations. However, being basic does not mean without logic.

We treasure this rudimentary logical thinking, as it illustrates the emergence of logical argumentation in ancient China, and of humankind as well.

Finding Patterns

Our research began with finding *Enumerations* in the text, which for Sun Tzu was a starting point for his reasoning patterns. *Pairs of Opposites* and *Metaphors* are also recognized by most authors writing about Sun Tzu. We are just the first ones doing a rigid search for them.

Other ways of conditional thinking can be found, many of the form: *if A then B*, leading towards deductions.

Further analysis on the conditional sentences showcased the subtleties such as backtracking, instructions, often intertwined with each other, where the ancient Chinese in the text sometimes suggested other translations than in the well known ones. Less frequent patterns, like *Preference Order* arose from doubts about correctness of the translation and from the thorough knowledge of ancient Chinese of our Chinese co-authors.

Here is an overview of the patterns we found and which we will look at in more detail later, see Patterns, on page 51.

Enumerations: To clarify reasoning, such as in: AoW Ch. III, par. 17,

```
17. Thus we may know that there are five essentials for
victory: ...
```

See Essentials for Victory, on page 152.

Pairs of Opposites: These are groups of two, where an element in the group has a meaning opposite to the other one. For example in AoW Ch. VII, par. 3:

```
° The difficulty of tactical maneuvering consists
  - in turning the devious into the direct,
  - and misfortune into gain.
```

See Maneuvering, on page 219.

Metaphors: A metaphor is defined as figure of speech that describes an object or action in a way that isn't literally true, but helps explain an idea or make a comparison. For example, in AoW Ch. IV, par. 19:

```
19. So, a victorious army as opposed to a losing one,
is as a pound's weight placed in the scale against a
single grain.
```

See: Military Method, on page 165.

Other Patterns: Other patterns that are used only a few times, are **Preference Order**, where Sun Tzu describes actions to be performed in a certain order, and **Definitions**, where terminology is defined, such as terrain types.

Conditional Sentences: Strictly speaking there is not *one* conditional sentence pattern. It can be considered as a set of patterns, where each pattern shows a particular type of reasoning. A conditional sentence can be thought of as a sentence with an *if-then* construct. An example of a conditional statement in AoW Ch. II, par 2. is:

```
» if victory is long in coming,
  ° then men's weapons will grow dull and their ardor
    will be damped.
```

See Duration, on page 130.

Other Topics

War and Game Theory

Game theory is the science of strategic interaction between opponents, including reasoning about what your opponents know or don't know.

What is the applicability of Game Theoretical principles to the work of Sun Tzu and do mind maps have anything to add to that? We will describe our findings in the chapter about Game Theory and Strategic Thinking, on page 77.

Translations Used

There are many translations of *the Art of War*, but in fact only one of these is in wide use: the translation by Lionel Giles from 1910 [24]. To our knowledge, this is the **only** translation that is freely available without copyright.

We used it, because we could modify the text as we wished. Moreover, the bi-lingual websites we used to search the text, such as
`https://www.yellowbridge.com/onlinelit/artofwar.php` and
`https://ctext.org/art-of-war`,
all use the same Giles translation.

We did not try, nor wanted, to create a completely new translation. Our group consists of logicians and an IT-person, certainly not translators, although knowledge of classic Chinese is a skill present within the group.

An important source of changes we made to the English translation was our study of the Chinese version of the mind maps, which uncovered more patterns than the English translations could provide, and which caused us to adapt the English translation to try to show the same patterns, where applicable.

An overview of the translations available is presented here: Translations of The Art of War, on page 391.

Other Historical Books on War

Other historical books about war are fundamentally different. We describe these differences in section: Other Historical Books about War, on page 17.

Sun Tzu and the Art of War

Abstract This chapter provides an overview of who Sun Tzu was and what is in his book, *the Art of War*, followed by a reference to other historical books about war.

Introducing Sun Tzu and The Art of War

The Art of War is an ancient book written by *Sun Tzu*, from the late Spring and Autumn Period, about 500 BC in China. This should not be taken verbatim: the author is believed to have lived around 2500 years ago, but the oldest written text is supposed to have been produced during the Warring States period some 200 years later.

On Sun Tzu

Since the purpose of our book is to present an analysis of the text of Sun Tzu's Art of War, based both on the canonical Chinese text and the translation by Giles produced in 1910, there is little reason to present an extensive introduction of the historical, philosophical or cultural background of this work. These topics are discussed in the various translations which we have studied during our project, and we do not claim to present any original contribution to them in this book.

In a separate chapter we present a survey on the history of Western translations and on the various translation editions we have consulted, see Editions and Translations of Sun Tzu, The Art of War, on page 391.

Nevertheless, for the purpose of a general audience, some basic information is in order. We state some facts here, and refer to earlier work for details, if appropriate.

Below is a small part of the timeline of Chinese history, see "The seven Military Classics of Ancient China" [59]. We highlight the period in which Sun Tzu supposedly lived.

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2205 - 256 BC	Hsia, Shang and Chou Dynasties
770 - 476 BC	Spring and Autumn Period
551 - 479 BC	Confucius
Around 500 BC	**Sun Tzu (or: Sun Zi, Sun Wu)**
476 - 221 BC	Warring States Period
Around 360 BC	Sun Bin
221 - 207 BC	Qin Dynasty - Unification of China
206 BC - 220 AD	Han Dynasty

. . .

Sun Tzu, the author of *the Art of War*, is believed to have lived from 544 BC to 496 BC during the Spring and Autumn period in China. He was born in the state of Qi and moved to the state of Wu where he served under King Helu, and where he contributed substantially to the military supremacy of Wu during this period. The historical and military context is excellently explained in the edition of "the Art of War" of Sawyer [57]

The historical records do not provide definitive evidence that Sun Tzu actually existed. He is mentioned in the records of the Grand Historian Sima Qian [60, 61, 93], which were composed during the Han Dynasty more than four centuries after his life. His biography in Sima Qian's work primarily deals with the notorious legend how Sun Tzu was invited by the king of Wu to train an army composed of women, and the fatal consequences of this exercise for two favourite concubines of the King. A story which is quite at odds with the philosophy as expressed in *the Art of War*, and it may well have been invented some centuries after the fact in order to accommodate the Legalist ideology [1]. The story is mentioned in several of the translations [2, 1, 57] of the AoW.

Another complication is the confusion between two different texts called *the Art of War*. The second text is authored by a possible descendant of Sun Tzu: Sun Bin, who lived some 150 years after Sun Tzu, around 380 BC to 316 BC, during the Warring States period. Through the discovery of the bamboo strips in the Yin-Ch'üeh-Sahn excavation in 1972, it was confirmed that there are two different books and also two authors.

Various anachronistic elements involving military equipment and tactics indicate that the written version of the Art of War was composed during the Warring States period. One possible scenario is that the ideas of Sun Tzu were transmitted orally for 150 years and that it was actually Sun Bin who wrote them down for the first time, separating the transmitted ideas from his own ideas by writing two books.

In the edition of Victor Mair [46] a table is presented on page 29, with suggested dates ranging from 345 BC to 272 BC indicating when the individual 13 chapters were first written. The chapters 8-11 contain practical recommendations and are believed to be the oldest parts, whereas the chapter on spies seems to be the most recent one. These dates are at odds with the above hypothesis that Sun Bin possibly coded the thirteen chapters.

Contrary to other Chinese classics the interest in Sun Tzu in the western world is rather recent. The first edition in a European language is the French edition of 1772 by Amiot [2, 3], which was almost unnoticed for more than 150 years. Early editions in English were produced by Calthrop [13] and Giles [23] but only after the second world war Sun Tzu's text became popular, also outside the world of military history.

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[1] Legalism is a classical Chinese philosophical school of thought dating from before the Qin period, which emphasizes a strong governmental and military organization for the purpose of state building. This philosophy was inspirational for the unification of China during the Qin dynasty in 221 BC, but after its demise, triggered by the death of the Qin emperor, the philosophy was abandoned. Later in history it has found supporters again, including Mao Zedong. [53]

On the Art of War

Before we start looking at the logic of *the Art of War*, we should briefly describe what it contains. Note that our book restricts itself to the core text consisting of the thirteen chapters. We have not included additional texts, such as the dialogue between Sun Tzu and the King of Wu mentioned earlier in this chapter, which were also discovered in the 1972 excavation, and which are included in several translations, for example in the edition edited by Ames [1]. Neither do we discuss the contributions of the 11 classical Chinese commentators, which can be found in several of the translations we have consulted.

We should also ask this question: why would you want to read and study a 2500 years old book on military strategy, discussing chariots, spears, marching 50 Li and so on? The answer is that the book contains much more than that: the primary content is presented in an abstract way. You might not like reading about military terminology, but if you fill in business competitor for enemy, commander or CEO for general and employee for soldier, Sun Tzu will give you plenty of food for thought.

Although it seems to have taken several centuries to write *the Art of War*, the structure as it is now, is rather logical: the first six chapters are more theoretical and more philosophical, while the last seven are more practical. It seems that the last chapters were written first, as a set of practical rules and recommendations.

For our short overview, we used the result of our mind map study, which provided us with a concise set of topics included in the book, and a structured way of showing some quotes. Note that the numbers in the text refer to paragraph numbers of the Giles [24] translation.

I. START PLANNING

Topics: Vital Importance, Constant Factors, Deliberations, Deception, Calculations

This is a chapter about planning, or *calculations* as Sun Tzu calls it.

```
26. The commander who makes calculations in his temple
before the battle is fought:
  » if they are many
    ° he wins a battle
  » if they are few
    ° he loses a battle
  » What if there are no calculation at all?
It is by attention to this point that I can foresee who
is likely to win or lose.
```

II. WAGING WAR

Topics: Cost, Duration, Skill, Prices, Rewards, Result

High cost and long duration are main factors that can result in losing a war.

```
19. In war, then, let your great object be victory, not
lengthy campaigns.
20. Thus it may be known that
```

- the leader of armies is the arbiter of the people's fate,
- the man on whom it depends whether the nation shall be in peace or in peril.

III. PLANNING ATTACK

Topics: Art of War, Excellence, Leadership, Rules in War, Guardian, Essentials for Victory, Knowing the Enemy and Yourself

This chapter contains an exploration of the factors that can make the difference between winning or loosing an attack.

18. Hence the saying:
    - If you know the enemy and know yourself, you need not fear the result of a hundred battles.
    - If you know yourself but not the enemy, for every victory gained you will also suffer a defeat.
    - If you know neither the enemy nor yourself, you will succumb in every battle.

IV. TACTICAL DISPOSITIONS

Topics: Good Fighter, Defensive and Offensive, Excellent Victory, Military Method

Tactically, it may be possible to secure yourself agains defeat, but if the enemy matches your abilities, you may still not be able to win.

15. Thus it is that in war
    - the victorious strategist only seeks battle after the victory has been won,
    - whereas he who is destined to defeat first fights and afterwards looks for victory.

V. ENERGY

Topics: Army Size, Weak and Strong, Direct and Indirect, Circumstance, Order and Disorder, Momentum

Combinations and variations which can be combined endlessly to form new tactics. At the end of this chapter we find:

- 23. Thus the energy developed by good fighting men is as the momentum of a round stone rolled down a mountain thousands of feet in height.

So much on the subject of energy.

VI. WEAK POINTS AND STRONG

Topics: Time of Attack, Success of Attack, Fighting, Place of Attack, Tactical Dispositions, The Way in War

The chapter is about finding the weaknesses of the enemy and using your own strengths.

» 28. Do not repeat the tactics which have gained you one victory,
  ° but let your methods be regulated by the infinite variety of circumstances.

VII. CONTENDING

Topics: Orders, Maneuvering, Circumstances

The first part of this chapter talks about maneuvering. Maneuvering means moving the army, or parts of it. It explains what happens if you march various distances, with the effect of destroying the army if you walk too far.

The second part of the chapter talks about circumstances, like keeping the army in good spirits. Further, there are axioms about when and when not to employ troops.

» 33. It is a military axiom:
  ° ...
  ° Leave an outlet free for a surrounded army.
  ° Do not press a desperate foe too hard.

VIII. NINE VARIATIONS

Topics: Circumstance, Variations, Five Dangerous Faults

This chapter talks about army positions and what to do in various circumstances. The commander has the highest authority on the battlefield and therefore there are commands of the sovereign which must not be obeyed.

» 11. The art of war teaches us to rely
  ° not on the likelihood of the enemy not coming,
    - but on our own readiness to receive him;
  ° not on the chance of his not attacking,
    - but rather on the fact that we have made our position unassailable.

IX. THE ARMY ON THE MARCH

Topics: Four Useful Branches of Military Knowledge, Preferences, Terrain Type, Neighborhood, Circumstances, Commanding

This is a long chapter dealing with warfare in different conditions, places, what can happen while marching, and rules for commanding.

```
» 40. It is not true that more troops are better
  ° do not overwhelm your enemy with numbers
» What we can do is simply to concentrate all our
  available strength,
  ° keep a close watch on the enemy,
  ° and obtain reinforcements.
» 41. He who exercises no forethought but makes light
  of his opponents
  ° is sure to be captured by them.
```

X. TERRAIN

Topics: Terrain, Calamities, Good Commander, Authority, Way to Victory

As the title suggests, this chapter handles terrain, of which there are six types.

```
» 31. Hence the saying:
  ° If you know the enemy and know yourself,
    - your victory will not stand in doubt;
  ° if you know Heaven and know Earth,
    - you may make your victory complete.
```

XI. THE NINE SITUATIONS

Topics: Nine varieties of Ground, Skillful Leaders, Invading Army

This is the longest chapter in the book. It contains several miscellaneous subjects, starting with rules about how to fight in various types of terrain, of which there are nine here, although there seem to be only 6 types of hostile territory. A next subject is about how to care for and handle the soldiers and the army, followed again by a discussion about terrain.

```
» On desperate ground,
  ° I would proclaim to my soldiers the hopelessness
    of saving their lives.
  ° 51. For it is the soldier's disposition
    - to offer an obstinate resistance when
      surrounded,
    - to fight hard when he cannot help himself,
    - and to obey promptly when he has fallen into
      danger.
```

XII. THE ATTACK BY FIRE

Topics: Attack with Fire, Season to Attack, Variations, Enlightened Ruler, Commanding, Keeping Peace

Sun Tzu gives very specific advice how to attack with fire, and he briefly also talks about water. The end of the chapter contains more general rules for the commander to follow.

`[Reversibility]`

```
  » [Able]
    ° 20. Anger may in time change to gladness;
    ° vexation may be succeeded by content.
  » [Unable]
    ° 21. But a kingdom that has once been destroyed
      - can never come again into being;
    ° nor can the dead ever
      - be brought back to life.
  » 22. Hence,
    ° the enlightened ruler is cautious,
    ° and the good commander very alert.
This is the way to keep a country at peace and an army
intact.
```

XIII. THE USE OF SPIES

Topics: The Reason to Use Spies, Foreknowledge, 5 Classes of Spies, Using Spies, Security Breach, Information, Converted Spies, Enlightened Ruler, Conclusion

Sun Tzu describes five different types of spies whose roles vary between obtaining information from the enemy to planting false information with them.

```
27. Spies are a most important element in warfare,
On them depends an army's ability to move.
```

Other Historical Books about War

Our book is not intended to present a comprehensive history of military philosophy; we leave that for other historians. However, some information should be presented in order to position the book by Sun Tzu in the context of other authors both in and outside China. Strategic thought has not been confined to China, and neither has warfare. Moreover, the nature of warfare has changed fundamentally during the periods that these books were written.

Books on Strategy Theory in Ancient China

The Art of War did not appear out-of-the-blue on its own. It is included in a series of seven military classics [59], written between 1100 B.C and 1063 A.D. Sun Tzu’s *the Art of War* was certainly the most famous. It shows that considering strategy and tactics of military operations were an important issue at the time. The list of classic texts is:

1. T’ai Kung’s Six Secret Teachings (11th cent. BC)
2. The Methods of the Ssu-ma (1000-700 BC)
3. **Sun Tzu, the Art of War (515-512 BC)**
4. Wu-tzu (440-381 BC)
5. Wei Liao-tzu (350-240 BC)
6. Three Strategies of Huang Shih-kung (Han dynasty, around 0 AD)

7. Questions and Replies between T'ang T'ai-tsung and Li Wei Kung (Sung Dynasty, 1023-1063 AD)

For some texts, including *the Art of War*, it is questionable whether they have a historical origin, or whether they are forgeries dating from later periods. The precise dating and the true identity of the authors of these works are subject of an intense discussion among contemporary scholars.

The text of Sun Tzu stands out by being structured in recurring patterns, such as enumerations and conditional statements, and by discussing the topics on a far more **abstract level**, using categorizations and rules.

One major development is the change of military equipment during these centuries, like the transition from Chariots to ridden Cavalry, and the introduction of the crossbow. We refer to the extensive studies by Sawyer [58] for more information on this topic.

A characteristic change which occurred during the Chou dynasty (before 256 BC), the Spring and Autumn period and the Warring States era, is that war transformed from a gentleman's game into brutal massive battles. [2]

By way of illustration: inspecting the history of the Qin dynasty as described by the Grand Historian Sima Qian[62, 92], one can observe that the number of casualties during battle (as far as specified in the text) crossed the 10,000 boundary after 500 BC. In the fourth century BC numbers like 80,000 are not uncommon. During the 56 years of the reign of king Zhaoxiang (306-251 BC) there were over one million casualties[62].

The gentleman's game nature of war during the early Chou dynasty is nicely illustrated in the first chapter of the Methods of the Ssu-Ma [59] (the second text in the corpus of the seven classics). We cite from the translation by Ralph D. Sawyer[59].

> In antiquity they did not pursue a fleeing enemy more than one hundred paces or follow a retreating enemy for more than three days, thereby making clear their observance of the forms of proper conduct [li]. They did not exhaust the incapable and had sympathy for the wounded and the sick, thereby making evident their benevolence. They awaited the completion of the enemy's formation and then drummed the attack, thereby making clear their good faith.

Compare this with what can be found in the Six Secret Strategies of T'ai Kung (11th cent. BC, section 52 in chapter VI):

> The T'ai Kung said:"When the enemy has begun to assemble they can be attacked.
> When the men and the horses have not yet been fed they can be attacked.
> ...
> When they are fleeing they can be attacked.
> When they are not vigilant they can be attacked.
> When they are tired and exhausted the can be attacked.
> ...."

Sun Tzu recommends as well to exploit weaknesses of the enemy whenever possible.

There are in the methods of Ssu-Ma, chapter 1 [59], also instructions given to not abuse the enemy's civilians:

---

[2] Similar transitions have been observed in the nature of war in Europe, as described in the introductions of von Clausewitz and Machiavelli [14, 45].

> When you enter the offender's territory, do not do violence to his gods; do not hunt his wild animals; do not destroy earthworks; do not set fire to buildings, do not cut down forests; do not take the six domesticated animals, grains, or implements. When you see their elderly or very young, return the without harming them. Even if you encounter adults, unless they engage you in combat, do not treat them as enemies. If an enemy has been wounded, provide medical attention and return him.

Sun Tzu is more pragmatic in this respect: it is better to conquer the territory of the enemy and leave his army intact, than to destroy it, without an explicit prohibition against the latter. He writes in Ch. III, par. 1:

```
It is better to capture a country intact,
  » than to destroy a country;
It is better to capture an army intact,
  » than to destroy an army;
 . . .
```

Books on Strategy Theory Outside China

As stated before this is not a book about military history. We just like to indicate some striking differences with the teachings of famous military strategists in the history of Europe.

The most famous cultures based on their military power are the Greek and the Romans. We have not looked at the Greeks, since it is unlikely that they were influenced by China in any way. Looking at the Roman philosophy of warfare an interesting question is whether there has been any influence of the Chinese insights on Rome. After all there have been trade relations between Rome and China in the second and third century along the Silkroad. Giles in his editorial comments considers it likely that knowledge about Sun Tzu has arrived in Rome (page 73 in [23]).

In this context, a relevant author from the Roman world is Flavius Vegetius, who wrote a book *Epitoma Rei Militaris* [72, 73, 74] during the late fourth or early fifth century. Hence, if the Romans had learned about Sun Tzu, Vegetius should have known about it as well. But Vegetius, who claims to build upon on the ancient knowledge which has made Rome invincible, bases himself on Roman authors only.

Also, the topics dealt with are quite different from those described by Sun Tzu. The text of Vegetius is composed of four books: book I deals with training of legionaries, book II describes the organization of a legion and an army, while Sun Tzu mentions almost nothing about the organization of an army or its training. Book IV deals with topics like sieges, and naval warfare. Sun Tzu does not describe naval warfare, and he strongly discourages sieges. In AoW Ch. II, par. 2, he writes:

```
2. The purpose of fighting is winning
  » if victory is long in coming,
    ° then men's weapons will grow dull and their ardor
      will be damped.
      - you will exhaust your strength if you lay siege
        to a town.
```

And in Aow Ch. III, par. 3-4, Sun Tzu writes:

```
 and the worst policy of all is to besiege walled cities.
```

> `4. The rule is, not to besiege walled cities if it can possibly be avoided.`

Only in book III of the Vegetius text, which deals with actual fighting, some ideas surface which can also be found in Sun Tzu. In book III, sections 9-13 Vegetius suggests preparatory calculations before starting a battle. Note that Sun Tzu requires extensive calculations before starting a war. Vegetius shares with Sun Tzu the advice that one should grant an escape road for a surrounded army, since the enemy, realizing that there is no escape, will fight until death and therefore provide a far greater resistance.

> (book III, 21): *Sed clausis ex desperatione crescit audacia, et cum spei nihil est, sumit arma formido*[3].

However, the real purpose of the advice is to make it easier to butcher the fleeing soldiers, while Sun Tzu recommends to only conquer the enemy, rather than also destroy him. In Ch. II par. 17 he writes:

> `The captured soldiers should be kindly treated and kept.`
>
> `18. This is called, using the conquered foe to augment one's own strength.`

Another interesting Roman author is Frontinus, who composed in the first century AD a catalogue of various tricks known by the Romans of his time [22]. However, this is a list without further explications and there seems to be no theory behind it (aside of the fact that it conforms to Sun Tzu's maxim that all warfare is based on deception). Moreover, his book predates the known contacts between Rome and China.

Moving some thousand years forward, there is Machiavelli, who also wrote a book called the Art of War [45], basing himself on classical authors, including Vegetius. Also in this case a large part of the book is dedicated to training an army, and the formations of the army you should use in combat, and illustrated by impressing diagrams positioning every individual soldier. Machiavelli discusses stratagems in chapter 4 of his Art of War, basing himself mostly on events during the classical age, but also some more recent ones. Some of his observations are close to the ones made by Sun Tzu, but it is extremely unlikely that Machiavelli knew about his Chinese colleague living some 2000 years before him.

A final author we should mention is von Clausewitz [14], from the 19th century, who can be seen to disagree with Sun Tzu about almost everything. For example, as we mentioned earlier in this chapter, Sun Tzu recommends forcing the enemy into surrender rather than to destroy him, while von Clausewitz writes in Book I, chapter 1,3 - page 102 in [14]:

> Now, Philanthropists may easily imagine there is a skillful method of disarming and overcoming an enemy without causing great bloodshed, and that this is the proper tendency of the Art of War. However plausible this may appear, still it is an error which must be extirpated; for in such dangerous things as War, the errors which proceed from a spirit of benevolence are the worst.

Then, there is the issue whether the use of stratagems and tricks in warfare is morally acceptable or not. Sun Tzu definitely is in favour; if you can defeat the enemy by deceit this is fine. It is better to win a war without serious fighting. We will have more discussion in later chapters about the idea of deceiving your enemy. Fur Sun Tzu, it is important, he writes in AoW Ch. I, par. 18:

---

[3] But in such situation, where no hopes remain, fear itself will arm an enemy and despair inspires courage.

```
18. All warfare is based on deception. So,
 » when able to attack,
   ° we must seem unable;
 . . .
```

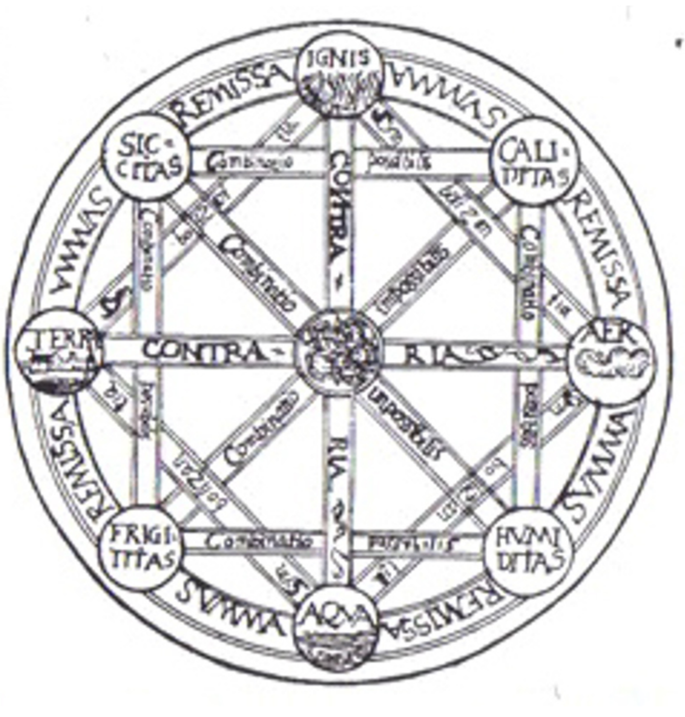
However, for von Clausewitz stratagems and tricks are only to be used as a last resource solution if everything else fails (Book III, chapter 8, page 276 in [14]):

> But, the weaker the forces become which are under the command of Strategy, so much the more they become adapted for stratagem, so that the quite feeble and little, for whom no prudence, no sagacity is any longer sufficient at the point where all art seems to forsake him, stratagem offers itself as a last resource. The more helpless his situation, the more everything presses towards one single, desperate blow, the more readily stratagem comes to the aid of his boldness.

The Chinese had a more pragmatic solution for a last resource scenario: the final item on the classic list of thirty-six strategies of Ancient China [75] plainly reads *If all else fails, retreat.*

Diagramming Ancient Text

Abstract We discuss several diagramming methods that could be used to find more structure and meaning in ancient texts, in particular in the text of *the Art of War*.


IGNIS
SVMMAS
REMISSA
SICCITAS
CALIDITAS
Combinatio
possibilis
CONTRA
RIA
impossibilis
SVMMAS
REMISSA
TERRA
AER
REMISSA
SVMMA
FRIGIDITAS
HVMIDITAS
SVMMA
AQVA
REMISSA

Leibniz's Characteristica Universalis
diagrammatic reasoning language, 1666.

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https://doi.org/10.1007/978-981-19-6250-9_3

Logic and Diagramming

In the introduction to this book (see: The Mind Map Method, on page 5), we described how showing the structure of a text in a mind map could make its meaning clearer.

In this chapter we discuss various diagramming techniques and how they could help to uncover patterns and logic in *the Art of War*. By applying various methods to pieces of Sun Tzu's text, we hope to convince you that using mind mapping, with some restrictions, is the best way to look at the structure of this text and derive patterns, meaning and logic from it.

Logic and diagramming was already done by the ancient Greek philosopher Porphyry. Later, in the seventeenth century, Leibnitz developed an Alphabet of Human Thought, with which he hoped to be able to reason by calculation. In the eighteenth century Euler developed a diagramming method that was similar to the still used and more famous Venn diagrams, developed in the 1880s by John Venn. Charles Pierce proposed existential graphs in 1882, and we should mention Noam Chomsky with his linguistic work in the 1970s. Note that we are not aiming for a descriptive syntactic analysis of the text of Sun Tzu, therefore we do not look at Chomsky's work further.

In the age of large computer screens and graphical tools, diagramming has again become popular. With graphical tools to manipulate the diagrams, there are new ways to make diagramming of text feasible. How we can derive logic from these diagrams is still an informal art, and the question arises whether it is possible at all.

Indeed, for a while, during the late twentieth century, diagramming was not very popular with logicians, if you consider this quote from 1984:

> [The diagram] is only a heuristic to prompt certain trains of inference; ...it is dispensable as a proof-theoretic device; indeed, ...it has no proper place in the proof as such.
> (A quote in *Logical Reasoning with Diagrams* by Allwen and Barwise [4], who quoted Neil Tennant [66]. Allwin and Barwise obviously wanted to challenge Tennants statement.)

Diagramming Methods

A major motivation to try and create diagrams from the text of the Art of War is the premise that *Humans Think Visually.* However, we need justification for the diagramming methods we are going to use. Our method of choice is to use mind maps and mind mapping software. We should consider though, that maybe there are better diagramming methods than mind maps, and maybe it is not so easy to find logic from these diagrams.

What would the requirements be for diagramming of old text? Foremost, the diagram should contain text, and preferably a complete representation of the text to be analyzed. This is because the diagram should be a new layer on the text, a new dimension, as we saw earlier. This means that there are not many tools that can be used. As we will see, most tools classify pieces of text and show the classification, instead of the text itself. We look briefly at some of these.

Diagramming tools that contain real text (as opposed to only symbols) can broadly divided in into three categories: *classification, linguistic (or statistical) analysis*, and *structure.*

Classification Diagrams

There are several ways of making classifications, for example *the tree of Porphyry, UML diagrams*, or *Venn diagrams.*

One of the oldest ways of *classifying* concepts is certainly the Porphyrian tree, stemming from the ancient Greek philosopher Porphyry.

An example of such a tree is shown in the left part of figure 3. We also made a more readable example, shown in the right part of this figure. It uses different data, but it serves the purpose of showing the concept.

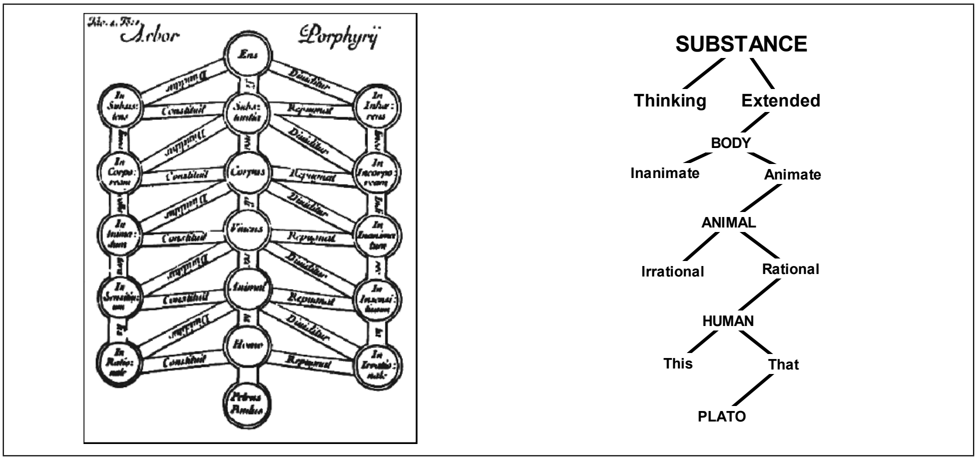

Arbor
Porphyrij
SUBSTANCE
Thinking
Extended
BODY
Inanimate
Animate
ANIMAL
Irrational
Rational
HUMAN
This
That
PLATO

Fig. 3: Tree of Porphyry example, from an old book (left), and an another example made with a mind mapping tool (right).

The tree of Porphyry on the right side of figure 3, can also be shown as in figure 4, which looks much more like the representation we are using for our mind maps.

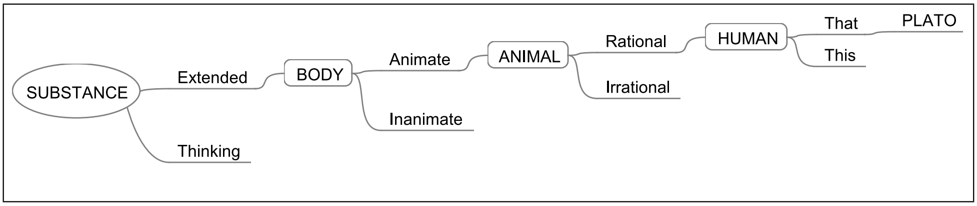

SUBSTANCE
Extended
Thinking
BODY
Animate
Inanimate
ANIMAL
Rational
Irrational
HUMAN
That
This
PLATO

Fig. 4: A Porphyrian classification tree as mind map

As this figure suggests, the tree of Porphyry is intended to *classify* things. Any mind mapping software will be able to show such a tree. However, a descriptive text, such as the text of Sun Tzu cannot be represented as a large tree of classifications.

In IT-circles several charting methods have been in use for a long time, as visual methods to help brainstorming, problem-solving, structuring of a subject and so on. We mention *UML* (Unified Modeling Language) [10], a diagramming language for object-oriented programming, or *Flowcharts*, that show a course of action, originally for computer programs, but now also used for business processes.

It is not clear how we could project an old Chinese text on any of these of similar charts. It would require, in case of using UML, a classification of objects found in the text. Or for flowcharts, a flow of events.

Undoubtedly it would have given us useful information about what are the important concepts in the text of *the Art of War*. It would have told us not much about the **structure** of the text.

We would have a similar problem with Venn diagrams, or other diagrams used in logic. They are able to classify objects in our text, they are not able to see the structure of the text itself. That prevents us from arguing abut the meaning of the text, because that done while the diagram is made. These diagrams would be useful *after* we expose the structure of the text, as a second step.

Linguistic Text Analysis

Another approach is to look at a linguistic text analysis. We tried *Voyant Tools* [99], a nice web based tool with which you can look at pieces of text, a corpus in their parlance, from many angles. As an example, we uploaded the English and Chinese text of Chapter 5. The tool made a colorful word cloud for each text. For English text, the tool automatically recognizes so called *stop words*, words that should be excluded from the cloud, such as “and” and “or”. For the Chinese text we prepared this list of stop words: 之者也而是以.

The analysis of the English text produced the following most frequent words: energy (8); like (7); fighting (5); indirect (5); men (5).

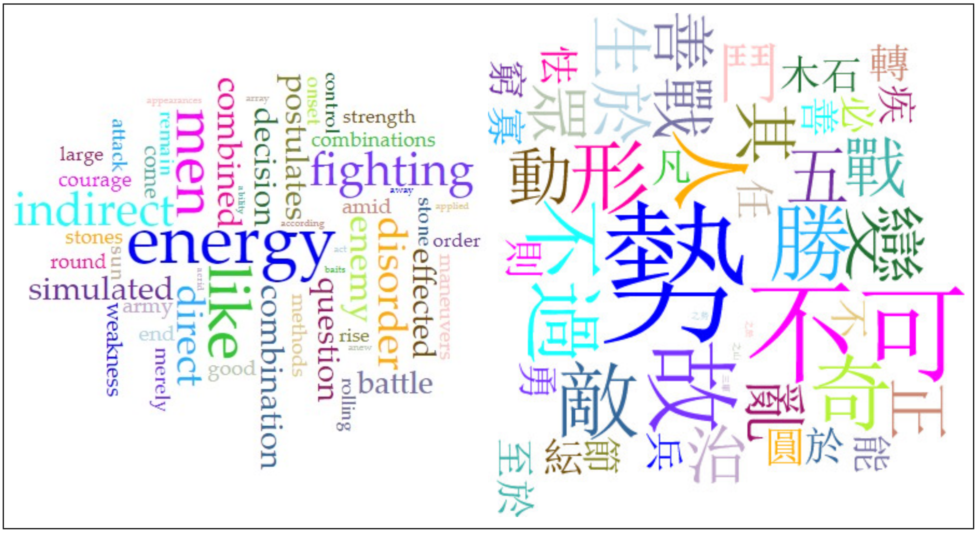
For the Chinese text, we found: 勢 (10); 如 (10); 不可 (6); 故 (5); 不過 (4), or: potential; as; impossible; therefore; but.

Maybe we should have filtered out more Chinese words. However, since we just wanted to look at the concept of doing text analysis in this way, we are leaving a more accurate analysis of the texts for a future study.

What we learned from further analysis with this tool is that *fighting, battle*, and *enemy* are important concepts to be looked at.

Tools that Show Structure

We turn our attention now to tools that can show structure in a text.


energy
indirect
men
fighting
like
combined
decision
postulates
disorder
enemy
combination
direct
simulated
effected
question
battle
strength
combinations
control
onset
large
courage
attack
remain
come
stones
round
sun
army
order
amid
stone
maneuvers
methods
rise
good
rolling
weakness
merely
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勢
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勝
戰
其
奇
正
治
亂
變
五
圓
於
能
至於
勇
則

Fig. 5: Word Cloud of AoW Ch. V - English and Chinese

Programming Language IDE's

Writing a computer program in C, C++, Java or Python or any other programming language may not seem like a diagramming activity, and of course it is not. However, if you use an Integrated Development Environment (IDE), or a code editor adapted to the language you write your software in, things are different. Your code may be formatted to show logic by indenting nested *if-then-else* statements, it lets *procedures* stand out, and it warns you if you made a mistake.

Similarly, if you are writing a book using a LaTeX aware editor, it may show you colored LaTeX commands, and therefore you can keep an overview of what the structure of your final document will look like.

Therefore, what we are looking for is software that can be used to show text similar to what an IDE does: showing structure in a program text. Before we consider mind mapping and mind mapping software as our best candidate for this purpose, we look at one more example: he *Reed-Kellogg Diagrams*.

Reed-Kellogg Diagrams

A curious diagramming method used in American schools in the early twentieth century, but now out of fashion, is the Reed-Kellogg sentence diagramming system [41]. Here is an example diagram:

Clear thinking makes clear writing

```
  thinking  |  makes  |  writing
============|=====================
  \ clear   |             \clear
```

The starting point is a horizontal line, divided by a vertical line. The subject of the sentence is located on the left of the vertical line, and a shorter vertical line divides the object from the verb in the sentence. Any sentence modifiers, such as adjectives and articles, are placed on a diagonal line below the noun or verb it is modifying. Here, “clear” is situated on a diagonal line below “thinking” and “writing”.

We made an attempt to draw a Reed-Kellogg diagram from an example that we used earlier:

Indirect tactics, efficiently applied, are inexhaustible as Heaven and Earth

```
 tactics          | are            | Heaven and Earth
==================|==================================
  \ indirect   \  | \ inexhaustible    \ as
                \
      | applied  \
    ==|===========
        \ efficiently
```

Maybe our solution is not accurate. Even so, or even more so, you can see some disadvantages for this method. This example clarifies perfectly what criteria we would like for our analysis tool, because the Reed-Kellogg method violates all of them!

Requirements for Text Diagramming

- All text should be in the diagram.
- The order of the text should be preserved.
- Analysis must be possible after importing the text.
- Automatic importing of text should be feasible.
- Interactive manipulation must be possible.
- The method should be applicable to English and Chinese in the same way.
- The diagram should take as little space as possible.

The diagramming method that can solve many of these problems is *mind mapping*, using mind mapping software.

Text Trees and Mind Maps

In this section we describe how the mind mapping method can be used to create structured text from source text, such as the text of *the Art of War*.

We start with a definition of what a mind map is:

> A *mind map* is a way to visualize information in an organizational and hierarchical structure.
>
> A mind map indicates a diagram consisting of nodes, connected to each other by lines. The graph should have a central theme in the center, and each theme could be related to other themes, connected by lines, thus forming a graphical tree-like structure. Lines can be drawn from any node to any other node to indicate relationships.

In the 1970-ies, Tony Buzan [12] made graphical brainstorming methods popular in business circles. He chose the word *mind map* to denote the kind of graph described above. See for a colorful example: [97].

A *Mind Map* is not necessarily a diagram that shows structure, like an IDE for programming languages does. Also, a mind map has no intrinsic meaning, other than that nodes are associated to other nodes via lines. In fact, a mind map can mean anything you want it to mean and therefore they are informal, unless you impose further rules on it.

Definition of a Text Tree Mind Map

For our purpose we put restrictions on mind maps, therefore we define a *Text Tree Mind Map (TTMM)* as:

> A Text Tree Mind Map (TTMM) is an oriented (or rooted) tree structure (see Knuth [42, page 373]), consisting of arcs (lines or associations), and vertices (nodes), where each vertex is the end of exactly one arc, except the root that has no arc pointing to it. The arcs starting at a specific vertex are ordered.

The difference with a mind map as defined by Buzan is that there should be no cycles in the tree, or more precise: there is only one arc ending at a single vertex. Another difference is the content of the nodes. Although in current mind map software a node can be anything: a document, a URL, a picture and so on, in the original definition a node should contain a single word concept, which then can be anything.

In a TTMM a node is the *chapter title*, a *topic title*, or a *sentence part.*

Using more familiar concepts, our definition becomes:

- For each chapter of *the Art of War* a mind map is created (two for chapter XI, because of its length).
- The mind map is shown as a tree, in a left-right orientation.
- The *chapter title* represents the Central Theme.
- The nodes contain the text in the chapter, split into parts as follows.
    - Each paragraph is split into sentences. A sentence is delimited by a sentence punctuation mark (. ! ? ;).
    - A sentence is split into sentence parts, delimited by punctuation marks or words (, and or so)
- An additional node type is used for *topic titles.*
- **The tree is strictly unidirectional, left-right and top down.**
- To the chapter title, only topic nodes can be attached. [1]
- One or more paragraphs of text can be attached to a topic title node.
- Each text node can have one or more child text nodes.
- Each child node can have only one parent node.
- If the tree is traversed left-right and top-down, concatenating the text for each node, the original text of the chapter should appear, augmented with section titles.

---

[1] At the start of every chapter, the phrase *Sun Tzu said:* is found, which is not really a topic, but which we still attach directly to the chapter title.

You could question whether TTMM's are still mind maps. It is certainly true that TTMM's contain a central theme, the chapter title, to which topics are attached, which is the primary requirement for a mind map. Therefore, we think that enough of the essence of a mind map is preserved to call a TTMM a mind map.

Advantages of Using a Text Tree Mind Map (TTMM)

There are several advantages of analysing a text with a TTMM:

- The use of mind mapping software! [2]
    - Text can easily be imported.
    - Manipulation of nodes.
- Software could be developed to assist in sentence splitting, importing and exporting text. What is available now is in its initial stages, but not really necessary to produce our TTMMs.
- The initial splitting of the text into text nodes can be done manually quite easily, or with help of scripts.
- The transformation of text to a text tree mind map (TTMM) is a lossless operation. When the mind map is traversed from left to right and top to bottom, the original text will reappear.
- If desired, the topic titles can be used as section titles.
- It is possible to give nodes additional attributes, like coloring.

A disadvantage of using off-the-shelf mind mapping software is, that the text-analyst must restrain him/herself to keep the mind map shaped within the rules given here. The most important rule to observe is, to keep the sequential order of the text intact.

Other aspects of using a TTMM are:

- A text, which is in essence a one dimensional stream of words, is given a second dimension.
- Visually inclined people (most of us), can more easily get an understanding of the text and look at its structure.
- We can use coloring to mark conditional sentences. As an example we did this for the AoW, Chapter VI, where we colored *conditions, consequences, advice*, and *conclusions.* In chapter: VI. WEAK POINTS AND STRONG - 虛實, on page 187 you can see this in action.
- It helps to see this structure when comparing the English and the Chinese mind maps.
- Incremental analysis of the text can be done, changing the TTMM after discussion or changes in translation.

In the rest of this book we will usually refer to a TTMM just as a *Mind Map.*

The Work of Fu Chao

Our work of using Mind Maps to study the structure of the text of Sun Tzu's *The Art of War* is certainly not the first study to do so. For example, a rather recent book, by

---

[2] See an overview of useful mind mapping software on page: 40.

Fu Chao [40], also looks at of the structure and associated meaning of Sun Tzu's book. Because we have only a Chinese text available and because the book is written in a classical Chinese style where evidence is presented in a different way as what is familiar to us, the true significance of Fu Chao's work as related to our work, needs further investigation, and is outside the scope of this book.

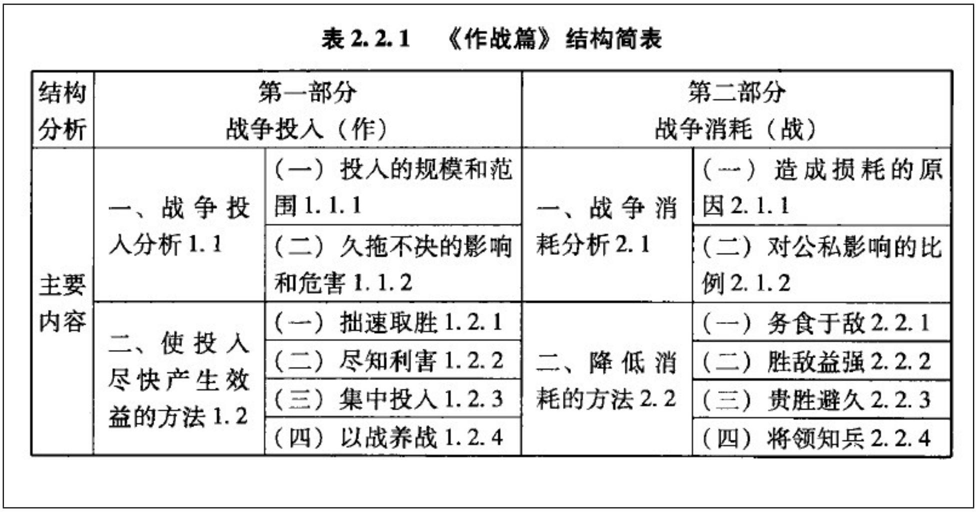

表 2.2.1 《作战篇》结构简表

结构分析	第一部分 战争投入（作）		第二部分 战争消耗（战）	
主要内容	一、战争投入分析 1.1	（一）投入的规模和范围 1.1.1	一、战争消耗分析 2.1	（一）造成损耗的原因 2.1.1
		（二）久拖不决的影响和危害 1.1.2		（二）对公私影响的比例 2.1.2
	二、使投入尽快产生效益的方法 1.2	（一）拙速取胜 1.2.1	二、降低消耗的方法 2.2	（一）务食于敌 2.2.1
		（二）尽知利害 1.2.2		（二）胜敌益强 2.2.2
		（三）集中投入 1.2.3		（三）贵胜避久 2.2.3
		（四）以战养战 1.2.4		（四）将领知兵 2.2.4

Fig. 6: An example diagram from Fu Chao's Book for chapter 1 of the AoW, page 96

Fu Chao concludes that at the most abstract level, there are two kinds of general structures, one for the whole book, and the other for the individual chapters. The structure for the entire book is called the "Tao-Fa-Shu" (道法术) structure, which means the theory is divided into three parts: 道 (Tao) is the most abstract principle, 法 (Fa, which means *laws*), and it refers to the strategies. 术 (Shu, which means *methods*) refers to the tactics.

According to Fu Chao, chapters 1-4 belong to 道 (Tao), chapters 5-9 belong to 法 (Fa) and chapters 10-13 belong to 术 (Shu). Fu Chao indicates that the structure of Tao-Fa-Shu is influenced by the traditional Chinese thoughts which emphasis on the number "three", such as in the book Yili (仪礼) and Liji (礼记).

Fu Chao mentions that *methodology* in general also has a three level structure: material, energy and information. This metaphorical way of writing is still used in some Chinese academic circles; however, the text is difficult to understand when it is translated into English.

Fu Chao states that also for individual chapters of *The Art of War*, the general structure is a three-fold structure: "introduction-body-conclusion". Each chapter can be divided into three parts:

1. The first part is introductory, introducing the importance of the issue and some general principles.
2. The second part is the body of the chapter. The body of the chapter usually splits into several smaller parts and each of the small parts talk about one aspect of the main point.

3. The third part is the conclusion, which combines the parts of the body.

Fu Chao provides three arguments why the Art of War should be analyzed a three-level structure (Tao-Fa-Shu):

1. On the Bamboo strips of the Silver Sparrow version of the Art of War, the characters are written in three columns. Fu says that: “this might be a sign that the Art of War has a three-part structure.” ([40], pp.33)
2. The structure of Tao-Fa-Shu is the “proto-structure” of the traditional Chinese culture. Fu indicates that: “According to historical literature, excavation and folklorists’ study, Yin-Yang structure and three-level structure are the proto-structures of Chinese Culture”. In addition, he argues that: “According to some excavation, the three-level structure may be related to the season of moon, it may also be related to the notions of Sancai (sky, earth and human being) and Sanguang (sun, moon and star)”, “the notion of three is a very important notion in the culture of Li. This point of view can be supported by a lot of evidence in Yili 仪礼 and Liji 礼记.” ([40], pp.34).
3. The structure of Tao-Fa-Shu fits the structure of Modern scientific theory. Modern scientific theory has a three-level structure. According to System Theory, an applied theory includes three levels: epistemology, methodology and technology. These three parts corresponds to Tao, Fa and Shu respectively ([40], pp.34-35).

For the first argument, there can be other explanations why the characters are written in three columns in the Bamboo strips. Concerning the second argument, we cannot find references for claims such as: “According to historical literature, excavation and folklorists’ study, Yin-Yang structure and three-level structure are the proto-structures of Chinese Culture” (([40], pp.34)). We could not find proof for the connection between Yili (仪礼), Liji (礼记) and *the Art of War*. Neither could we find the historical literature, excavation and the folklorists’ study Fu Chao is referring to in his third argument.

The three-level structure of the individual chapters is rather similar to our conclusions in chapter The Mind Mapping Perspective, on page 95.

A main and defining difference with Fu Chao’s approach is that we strive to keep the original text intact. From a mind map you should always be able to find the original text of the AoW, while the structure is found from the structuring of the tree into nodes and branches. This was described in detail in the section Text Trees and Mind Maps, on page 28 earlier in this chapter.

Instead, as far as we can make out, the text in the diagram presented by Fu Chao doesn’t occur verbatim in the AoW.

The Making of a Mind Map

Abstract This chapter describes an extended example of making a mind map for a chapter of The Art of War. We also give an example of adapting the mind map and the English translation as a result of comparing the Chinese and the English versions of the mind maps.

Creating a Mind Map from Text

In the previous chapter, see: Diagramming Ancient Text, on page 23, we laid the theoretical foundation for making Text Tree Mind Maps from the text of The Art of War. In this chapter we will put our theory into practice and show an extended example.

The text of *The Art of War* we used for our mind mapping work is taken from the Gutenberg website:
`https://www.gutenberg.org/17405`
We explained in section: Translations Used, on page 9, why we took this particular version of the AoW text.

After downloading the complete text file, `pg17405.txt`, we split this file into 13 smaller files, one for each chapter. Actually we made 14 files, because chapter XI is rather large. Consequently, we could copy the text and paste it into *Freemind*, to create a mind map. It is also possible to use other mind mapping software, but Freemind is the only program that presented the text in the simple way we liked.

An Example from AoW Chapter I

For this example we took a piece of text from Chapter I, where Sun Tzu considers in paragraphs 18-25, how to deceive the enemy and when.

The text as given by Giles, looks like this:

```
 18. All warfare is based on deception.
 19. Hence, when able to attack, we must seem unable;
```

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P. van Emde Boas et al., *Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps*, Logic in Asia: Studia Logica Library,
https://doi.org/10.1007/978-981-19-6250-9_4

```
    when using our forces, we must seem inactive;
    when we are near, we must make the enemy believe
    we are far away;
    when far away, we must make him believe we are near.
20. Hold out baits to entice the enemy. Feign disorder,
    and crush him.
21. If he is secure at all points, be prepared for him.
    If he is in superior strength, evade him.
22. If your opponent is of choleric temper,
    seek to irritate him.
    Pretend to be weak, that he may grow arrogant.
23. If he is taking his ease, give him no rest.
    If his forces are united, separate them.
24. Attack him where he is unprepared,
    appear where you are not expected.
25. These military devices, leading to victory,
    must not be divulged beforehand.
```

As we described in section Definition of a Text Tree Mind Map, on page 29, we should split the text into paragraphs, sentences and sentece parts. This can easily be done by hand.

After editing, the first lines of our example will look like this:

```
18. All warfare is based on deception.

19. Hence,
    when able to attack,
        we must seem unable;
    when using our forces,
        we must seem inactive;
    when we are near,
        we must make the enemy believe we are far away;
    when far away,
        we must make him believe we are near.

...
```

When we paste this piece into a new Freemind mind map, it will look as in figure 7:

Note that so far, we only made changes which reflect the organisation of the text as intended by its writer, Lionel Giles in this case. If we take a closer look at this mind map snippet, it seems the meaning of the conditional sentences suggest a regrouping of the nodes, and we should give the mind map an appropriate title. These changes are represented in figure 8:

After the regrouping, it is clear from the mind map in figure 8, that there is a list of similar conditional statements, which are translated in various ways, starting with *when*, or *if*. This led us to look at the Chinese text, and we saw that there the statements were much more uniform, as you can see from the mind map in figure 9.

We notice that the English translation makes use of different expressions to translate this list of conditions: *when, to, if, where.*

In the Chinese mind map these sentences all follow a clear structure in the original Chinese text:

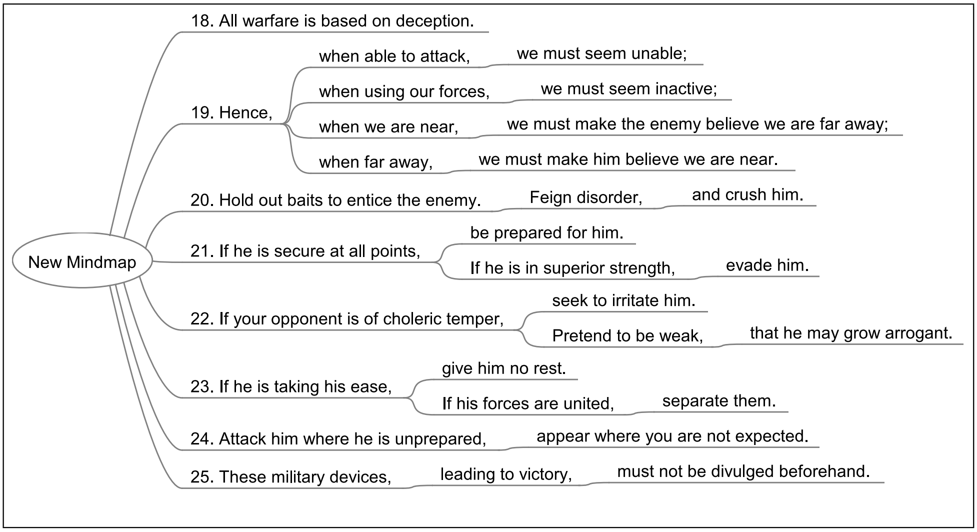

New Mindmap
18. All warfare is based on deception.
19. Hence,
when able to attack,
we must seem unable;
when using our forces,
we must seem inactive;
when we are near,
we must make the enemy believe we are far away;
when far away,
we must make him believe we are near.
20. Hold out baits to entice the enemy.
Feign disorder,
and crush him.
21. If he is secure at all points,
be prepared for him.
If he is in superior strength,
evade him.
22. If your opponent is of choleric temper,
seek to irritate him.
Pretend to be weak,
that he may grow arrogant.
23. If he is taking his ease,
give him no rest.
If his forces are united,
separate them.
24. Attack him where he is unprepared,
appear where you are not expected.
25. These military devices,
leading to victory,
must not be divulged beforehand.

Fig. 7: Deception - Split into Sentences

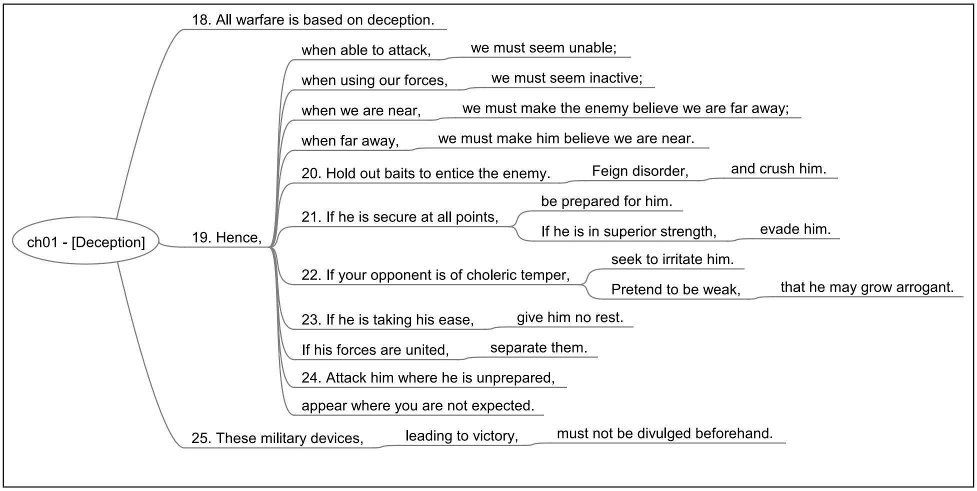

ch01 - [Deception]
18. All warfare is based on deception.
19. Hence,
when able to attack,
we must seem unable;
when using our forces,
we must seem inactive;
when we are near,
we must make the enemy believe we are far away;
when far away,
we must make him believe we are near.
20. Hold out baits to entice the enemy.
Feign disorder,
and crush him.
21. If he is secure at all points,
be prepared for him.
If he is in superior strength,
evade him.
22. If your opponent is of choleric temper,
seek to irritate him.
Pretend to be weak,
that he may grow arrogant.
23. If he is taking his ease,
give him no rest.
If his forces are united,
separate them.
24. Attack him where he is unprepared,
appear where you are not expected.
25. These military devices,
leading to victory,
must not be divulged beforehand.

Fig. 8: Deception - Modified Import

(in case of) A, do B.

A is a possible condition of your enemy: *able to attack, using their forces, getting close* etc., and B is what Sun Tzu suggest you to do for each condition: *make them unable, make them unable to use their forces, get away from them*, etc.

In the Chinese text, the 而 (ér) character indicates the logical relation between condition A and your reaction B, and the character 之 (zhī) is a possessive particle, here referring to the enemy.

To follow the Chinese original more closely, we changed the English text to read *when A, do B.* for all statements about deception, which makes the pattern of *pair of opposites* used here much more clear. The pair of opposites is a frequently used pattern by Sun Tzu see Pairs of Opposites, on page 53 for a description.

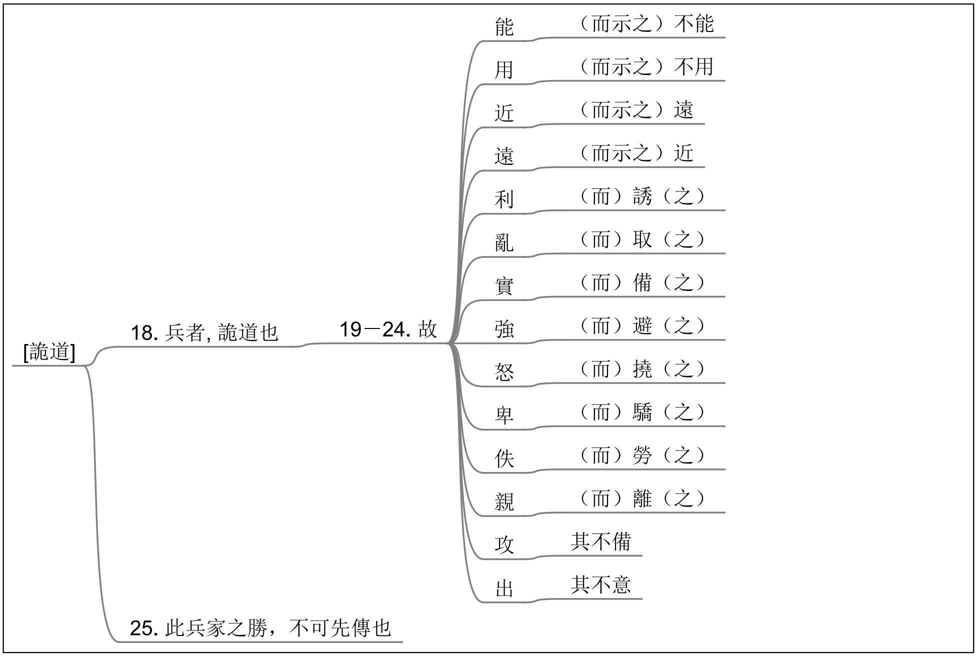


Fig. 9: Deception - The Chinese version

The improved English translation and structure looks as we have shown in figure 10.

Procedure for Making a Mind Map

From the above story, a practical procedure to create mind maps from old text emerges:

1. Create a text file per chapter.
2. Split the text into sentences and sub-sentences.
3. Import text into Freemind. Save this version as version one. So far this is a syntactical operation.
4. Regroup nodes by looking at the meaning of the text.
5. Look for patterns, such as *enumerations*, *if-then-else structures*, that have consequences for the representation of the mind-map nodes.
6. Make a comparison with the Chinese text.
7. Discuss
8. Repeat steps 4-7, until no changes are needed as a result of the discussion. [1]

---

[1] After modification of the initial text and importing it into the initial mind map, we chose to make all modifications to the text in mind maps directly. It is a good idea to save different versions of your mind maps for traceability.

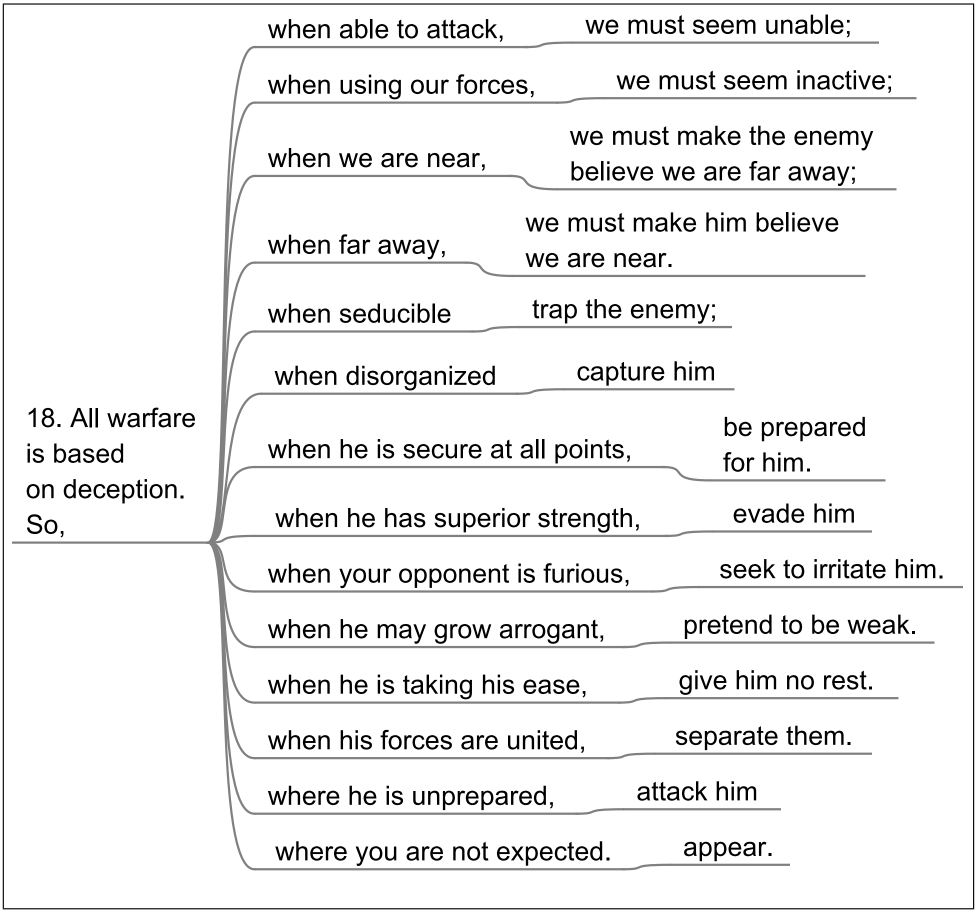

18. All warfare is based on deception. So,
when able to attack,
we must seem unable;
when using our forces,
we must seem inactive;
when we are near,
we must make the enemy believe we are far away;
when far away,
we must make him believe we are near.
when seducible
trap the enemy;
when disorganized
capture him
when he is secure at all points,
be prepared for him.
when he has superior strength,
evade him
when your opponent is furious,
seek to irritate him.
when he may grow arrogant,
pretend to be weak.
when he is taking his ease,
give him no rest.
when his forces are united,
separate them.
where he is unprepared,
attack him
where you are not expected.
appear.

Fig. 10: Deception, after changes to the translation

Finding Interesting Text

Having our procedure to make text-tree-mind-maps (TTMMs) in place, we would like to look at one more example.

Many people have seen or heard a quote from Sun Tzu, even if they never heard of him, such as:

Famous Quotes

- *Appear weak when you are strong, and strong when you are weak.*
- *Victorious warriors win first and then go to war, while defeated warriors go to war first and then seek to win.*
- *Treat your men as you would your own beloved sons. And they will follow you into the deepest valley.*

- *The good fighters of old first put themselves beyond the possibility of defeat, and then waited for an opportunity of defeating the enemy.*

Maybe you noticed that these quotes all concern war and fighting. However, in Sun Tzu's book there is other content that would be worth mentioning in any list of quotes. For example, this text from chapter V, par. 7-9:

```
[From Five to Infinity]
  » There are not more than five musical notes,
    ° yet the combinations of these five give rise to
      more melodies than can ever be heard.
  » There are not more than five primary colors,
    ° yet in combination they produce more hues than
      can ever been seen.
  » There are not more than five cardinal tastes,
    ° yet combinations of them yield more flavors than
      can ever be tasted.
```

Our interpretation of this text is *that there are always unlimited possibilities even with limited means.*

Sun Tzu continues his text in chapter V, par. 10-11 with:

```
10. In battle, there are not more than two methods of
    attack
  » the direct and the indirect;
    ° yet these two in combination give rise to an
      endless series of maneuvers.
  » 11. The direct and the indirect lead on to each
    other in turn.
    ° It is like moving in a circle--you never come to
      an end.
    ° Who can exhaust the possibilities of their
      combination?
```

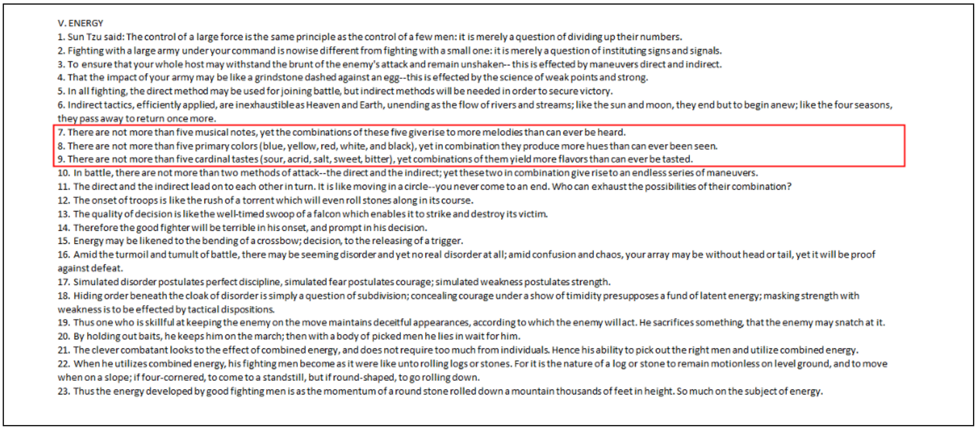
This now relates back to engaging in battle, but if abstracted to business tactics, it could be very useful advice.

Finding the Quote in Chapter V

The text of AoW Ch. V looks like in figure 11 from a distance.

The text in this figure is too small to read, partly because the page of the book is not wide enough, and partly because you would see not more detail if you looked at the text for the first time. If the sentence we are looking for was not bordered in red, then you would probably not notice that it was interesting.

Importing the text, following the process we explained in the previous sections, you will get a mind map as in figure 12.



V. ENERGY

1. Sun Tzu said: The control of a large force is the same principle as the control of a few men: it is merely a question of dividing up their numbers.
2. Fighting with a large army under your command is nowise different from fighting with a small one: it is merely a question of instituting signs and signals.
3. To ensure that your whole host may withstand the brunt of the enemy's attack and remain unshaken-- this is effected by maneuvers direct and indirect.
4. That the impact of your army may be like a grindstone dashed against an egg--this is effected by the science of weak points and strong.
5. In all fighting, the direct method may be used for joining battle, but indirect methods will be needed in order to secure victory.
6. Indirect tactics, efficiently applied, are inexhaustible as Heaven and Earth, unending as the flow of rivers and streams; like the sun and moon, they end but to begin anew; like the four seasons, they pass away to return once more.
7. There are not more than five musical notes, yet the combinations of these five give rise to more melodies than can ever be heard.
8. There are not more than five primary colors (blue, yellow, red, white, and black), yet in combination they produce more hues than can ever been seen.
9. There are not more than five cardinal tastes (sour, acrid, salt, sweet, bitter), yet combinations of them yield more flavors than can ever be tasted.
10. In battle, there are not more than two methods of attack--the direct and the indirect; yet these two in combination give rise to an endless series of maneuvers.
11. The direct and the indirect lead on to each other in turn. It is like moving in a circle--you never come to an end. Who can exhaust the possibilities of their combination?
12. The onset of troops is like the rush of a torrent which will even roll stones along in its course.
13. The quality of decision is like the well-timed swoop of a falcon which enables it to strike and destroy its victim.
14. Therefore the good fighter will be terrible in his onset, and prompt in his decision.
15. Energy may be likened to the bending of a crossbow; decision, to the releasing of a trigger.
16. Amid the turmoil and tumult of battle, there may be seeming disorder and yet no real disorder at all; amid confusion and chaos, your array may be without head or tail, yet it will be proof against defeat.
17. Simulated disorder postulates perfect discipline, simulated fear postulates courage; simulated weakness postulates strength.
18. Hiding order beneath the cloak of disorder is simply a question of subdivision; concealing courage under a show of timidity presupposes a fund of latent energy; masking strength with weakness is to be effected by tactical dispositions.
19. Thus one who is skillful at keeping the enemy on the move maintains deceitful appearances, according to which the enemy will act. He sacrifices something, that the enemy may snatch at it.
20. By holding out baits, he keeps him on the march; then with a body of picked men he lies in wait for him.
21. The clever combatant looks to the effect of combined energy, and does not require too much from individuals. Hence his ability to pick out the right men and utilize combined energy.
22. When he utilizes combined energy, his fighting men become as it were like unto rolling logs or stones. For it is the nature of a log or stone to remain motionless on level ground, and to move when on a slope; if four-cornered, to come to a standstill, but if round-shaped, to go rolling down.
23. Thus the energy developed by good fighting men is as the momentum of a round stone rolled down a mountain thousands of feet in height. So much on the subject of energy.

Fig. 11: The original text of chapter 5, as translated by L. Giles.

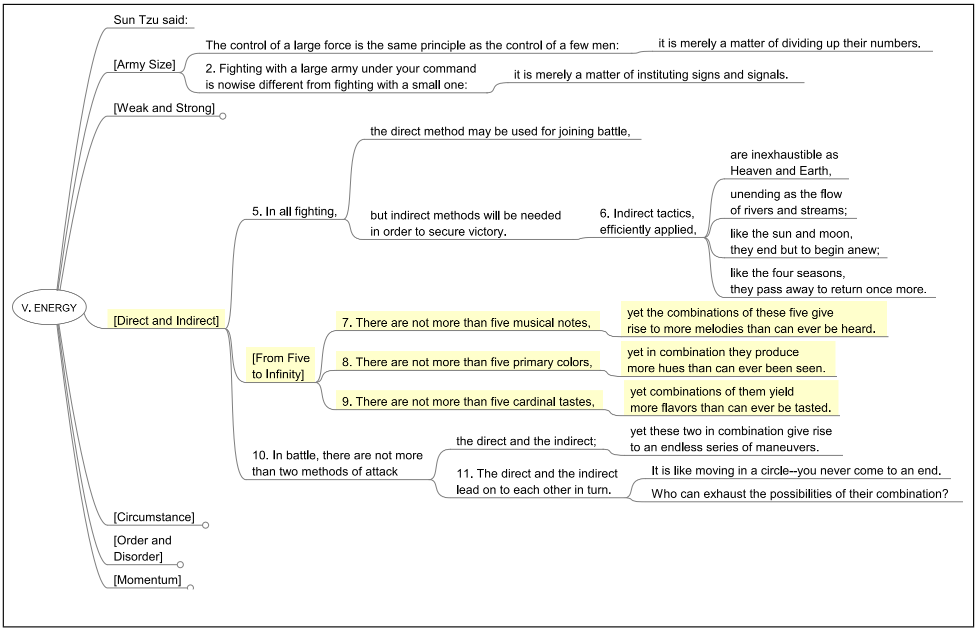

V. ENERGY
Sun Tzu said:
[Army Size]
The control of a large force is the same principle as the control of a few men:
it is merely a matter of dividing up their numbers.
2. Fighting with a large army under your command is nowise different from fighting with a small one:
it is merely a matter of instituting signs and signals.
[Weak and Strong]
[Direct and Indirect]
5. In all fighting,
the direct method may be used for joining battle,
but indirect methods will be needed in order to secure victory.
6. Indirect tactics, efficiently applied,
are inexhaustible as Heaven and Earth,
unending as the flow of rivers and streams;
like the sun and moon, they end but to begin anew;
like the four seasons, they pass away to return once more.
[From Five to Infinity]
7. There are not more than five musical notes,
yet the combinations of these five give rise to more melodies than can ever be heard.
8. There are not more than five primary colors,
yet in combination they produce more hues than can ever been seen.
9. There are not more than five cardinal tastes,
yet combinations of them yield more flavors than can ever be tasted.
10. In battle, there are not more than two methods of attack
the direct and the indirect;
yet these two in combination give rise to an endless series of maneuvers.
11. The direct and the indirect lead on to each other in turn.
It is like moving in a circle--you never come to an end.
Who can exhaust the possibilities of their combination?
[Circumstance]
[Order and Disorder]
[Momentum]

Fig. 12: The mind map of AoW chapter 5 (Some of the structures are collapsed to get a better overview).

For the visually inclined persons, it should be clear that something interesting is going in in paragraphs 7-9. [2]

---

[2] In the translation of L. Giles, the five ingredients for infinite possibilities are given, while in the original Chinese text, these are omitted. Maybe because every Chinese person supposedly knows the five ingredients for each category. We omitted this explanatory text in our final mind map version. For example, the primary colors that Giles mentions, are blue, yellow, red, white, and black. For web developers, three would be enough: the RGB colors: red, green and blue. Although, in the RGB scheme you can get only 16,777,216 colors, which is less that infinity!

If you look to our larger mind map and relate that to the original text, you see that all text is still there, but that structure is added, which makes it easier to see what this chapter contains and what it is trying to tell us.

For more detail, the complete mind maps, and the patterns we found, see AoW chapter V. ENERGY - 兵勢, on page 169.

Mind Mapping Software

When it became possible to show graphics on computer screens, a multitude of tools to create mind maps became available. We are using the free and open source tool *Freemind*, that can be found here:
`http://freemind.sourceforge.net/wiki/index.php/Main_Page`.

We like the very simple representation Freemind allows: without colors, bells and whistles. This makes it possible to show the structure of the text clearly.

Freemind seems not to be well maintained anymore, although questions in a forum are answered. Some alternatives are: FreePlane [21], a derivative of FreeMind, which is more actively developed and still open source, or SimpleMind Pro [64], a reasonably priced tool that can read Freemind mind maps.

Unfortunately we could not find a good mind mapping tool that allows to show our mind maps interactively on the web. Static versions of mind maps for all chapters can be found on our website *SquaringtheCircles* [90].

Mind Maps on Paper

As described earlier, a primary objective of our work is to make the *structure and logic* of Sun Tzu's text visible. We did that by structuring the text into mind maps. The site `https://suntzu.squaringthecircles.com/` [90] shows a mind map for each chapter of *The Art of War*. If you look at them, you will see that the English versions all have a wide, landscape orientation. Even if we present a mind map in this orientation, the print will become too small to be readable if fitted on one page for each chapter. The problem is less visible for the Chinese versions of the mind maps, because, of course, Chinese characters represent whole words, therefore the sentences are much shorter than their English equivalents.

Our solution to make the text of the mind maps readable, is to show the whole mind map in one, two, or more parts, to give you an overview of the chapter. This is good enough to make the text readable on paper, and it may help to determine where in the structure the detailed mind maps should be placed and to have an overview of the content.

To be able to present better readable English text, we used some web-scripts to render the mind maps as *structured text*. You will see this structured text at the end of each chapter. We show this text using a mono-spaced font, to give it a more Chinese look. This structured text should read as an improved translation of the Giles [23] translation, preserving the structure of the mind map as good as possible.

Juxtaposition of the English and Chinese mind maps would have been a nice feature and we have considered doing this in several ways. However, it would be really difficult to split the English mind maps into logical chunks, together with their counterparts in Chinese. What could help to find English and Chinese mind map counterparts, is that the paragraph numbers as found in the English translation are inserted into the Chinese mind maps. [3]

Although one of our aims is to make an improved translation, in essence the text in the mind maps is still very much the text as made by Lionel Giles in 1910. Therefore, the text in this book does not qualify as a *new* translation. Nevertheless, we made many changes to the text, for example replacing archaic words by more modern ones. Also, we tried to bring the structure back by trying to use the same English word for each occurrence of a particular Chinese word. We tried to favor literal translation over a translation that tells a story.

A note on paragraph numbers: We kept the paragraph numbers found in the original text of Lionel Giles, wherever we could, and we also inserted them in many of the Chinese mind maps. The purpose of this is to find the patterns and other comments more easily in the mind maps.

Mind Mapping Results

When printing methods were restricted, text was the optimal way to balance between conveying information and efficient reproduction. However, tree structures are easier to present reasoning patterns because of parent nodes, children nodes, branching, so on and so forth. With modern technology, mind maps can be interactive, with nodes being collapsed or folded on demand, providing great freedom in focusing on the piece you are currently interested in. When we understood the usefulness of this analysis, we formalized our way of building the mind maps, and made one for each chapter of the book.

The mind mapping method helped us to lay out reasoning structures from text, and we believe this is a useful practice in general for analyzing ancient texts. Making mind maps forces the map-maker to draw close attention to each sentence, as well as its relationship with the rest of the text, making the reasoning pattern more clear than it otherwise could be.

The Mind Maps in Part 2 of this Book

In part 2 of this book, starting on page 102, each chapter of *The Art of War* is discussed in a separate book chapter, according to a rigid structure as follows:

- *Main Concepts.* A diagram showing the main subjects of the chapter, made with the TikZ mind mapping library of LaTeX.
- *Overview of the Contents.* A short description of what the chapter contains.

---

[3] Also, there are two websites: Yellowbridge [88] and Ctext [89], that show Chinese text and the English translation of L. Giles together.

- *The Chinese mind map.* The Chinese mind map is useful to have within each chapter, to be able to trace special characters. It is readable enough, although we sometimes have split the mind map in two ot three parts to achieve better readability.
- *The English mind map.* Although these mind maps are hard to read on paper, they should give enough everview of the chapter.
- *Details.* For each subject in a chapter of *The Art of War*, there is a mind map detail, sometimes with a detail of that detail. If the mind map fragment needs further detailing, a small dot at the end of a branch replaces that detail. The mind map fragment that could be placed at that dot position is shown directly underneath if possible. In the text for each topic a description for the *patterns* found for that topic can be found. [4]
- *Structured text.* This text is generated from the English mind maps and shows the complete text of the chapter. We put this text here to provide better readable text, that retains the structure of the mind map.

---

[4] Descriptions of the patterns defined in this book, are in chapter: Patterns, on page 51. A list of all instances of all patterns found, is in a separate section of the book, see: List of All Patterns, on page 369.

Logic

Abstract We examine thoughts about Logic in ancient and modern times and also the difference in thinking in the eastern and western parts of the world. In particular we discuss the claim that the Sun Tzu text contains contradictions.

Definitions of Logic

Given the fact that Logic is a central theme in our book, and more specifically the logic of Sun Tzu, we must discuss the question of what the word “logic” means in our context.

We are not so sure that in Sun Tzu’s text logic should be interpreted as it is used today for a mathematical theory, with many formula’s, theorems and proofs, like in modern text books. Neither are we sure that the mind maps used in this book to make the logic more clear, should be like the colorful spider webs on flip-over boards, as created by business people during brainstorms.

As a systematic study of argumentation, generations of scholars constantly developed logical methods, and logic has changed dramatically from when it was invented. To some extent, the history of logic reflects the evolution of human rational thinking. Today’s logic lays out the foundation for computer science, talks about relativity theory, and quantum physics.

We believe that in Sun Tzu’s time, the late 6th century BC, or almost three thousand years ago, argumentation was mostly motivated by intuition, and that divinity ironed truth. There was not much experimentation or empiricism, and the boundary between human beings and nature was still rather blurred. Humans did not have the kind of control or understanding of their surroundings as we do today.

When we look at *today’s* ideas of what logic is, we can find this definition: [1]

> Logic is the science that studies the formal processes used in thinking and reasoning.

---

[1] This definition is taken from: `https://www.merriam-webster.com/dictionary/logic`.

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P. van Emde Boas et al., *Analyzing the Logic of Sun Tzu in “The Art of War”, Using Mind Maps*, Logic in Asia: Studia Logica Library,
https://doi.org/10.1007/978-981-19-6250-9_5

The same dictionary provides also alternative definitions:

> *Logic* is a science that deals with the principles and criteria of validity of inference and demonstration: the science of the formal principles of reasoning.

Or:

> *Logic*: the formal principles of a branch of knowledge.

These definitions are clearly inspired by a contemporary Western perspective. When we are discussing the logic of Sun Tzu, we have to deal with the fact that we are considering 25 centuries in the past, and also a different part of the world, with respect to both geography and culture: ancient China.

Logic and Geography

Logic was not only different in Sun Tzu's time because it was long ago, but it may also have been a matter of culture and geography. Interesting research was done by E. Nisbett, where he argues in his book *The Geography of Thought* [48], that European thought and logic stems from a Greek, Aristotelian inheritance, based on individualistic thought. People in ancient Greece where traders, living in cities in coastal regions, which required independent actions and reasoning.

On the other hand, people living at the same time in China, were behaving according to Confucianism, in an agricultural society that would favor collective thinking and social relationships.

Nisbett writes in his book [48, page 27]:

> In place of logic, the Chinese developed a type of dialecticism. This is not quite the same as the Hegelian dialectic in which thesis is followed by antithesis, which is resolved by synthesis, and which is "aggressive" in the sense that the ultimate goal of reasoning is to resolve contradiction. The Chinese dialectic instead uses contradiction to understand relations among objects or events, to transcend or integrate apparent oppositions, or even to embrace clashing but instructive viewpoints.

He continues [48, page 27]: *As a consequence there is no necessary incompatibility between the belief that A is the case and the belief that not-A is the case.*

In Western logic this would amount to believing in a contradiction. [2]

In the sequel we discuss whether the claimed contradictions are real, or just instances of the pattern we call *pairs of opposites*. We look at the connection with Yin-Yang, and we discuss whether the contradictory character of some passages may be the result of reading the text in the context of some supposed self-evidences in the mind of the reader. Finally, we mention how inconsistent information can be used in order to deceive the enemy.

---

[2] The observation that Sun Tzu may contain contradictions can be found in the book of Yuen [79, page 62]. The issue was brought to our attention in a private discussion with Carl Hewitt [83].

Logic in China

An in depth study of the role of logic in China will become available in the forthcoming *Handbook of the History of Logic in China* [71].

There is also a book with ideas of a group of 25 scholars on this topic that can be found in a volume in the *5 questions series* edited by Fenrong Liu & Jeremy Seligman [86].

Our small group of logicians cannot offer the same depth of what logic meant in ancient China in the context of Sun Tzu as what the above-mentioned groups will be able to do. However, Sun Tzu was *not* a logician, but he was a military strategist. We restrict ourselves to considerations related to what our book claims to contribute: *the study of recurring patterns of reasoning* in the text of Sun Tzu. The interpretation of what we found is very much open for debate and subject for further work.

Contradictions

Nevertheless, let us look at some concepts that were relevant in Sun Tzu's time. Derek Yuen writes in his book titled *Deciphering Sun Tzu* [79, page 8]:

> …the Chinese employ logical principles that differ markedly from the formal logic of the West. This is something which can be found in the frequent use of paradox or contradiction in Chinese military and strategic treatises.

Note that these statements are made in the context of the observation that Sun Tzu frequently uses pairs of opposites. Possibly the phrases "contradiction" and "paradox" can be used in Chinese thinking, without the negative connotation these phrases have in Western thinking.

The linguistic origin of the Chinese word for "contradiction/paradox" (Mao-Dun 矛盾) stems from the Legalist terminology 矛楯. The word 矛楯 consists of two characters 矛 (spear) and 楯 (shield). It appears in the sections 難一 (Difficulty One) and 難勢 (Difficulty of Shi) in Hanfei Tzu's book.

The Chinese text in the section "Difficulty One" that mentions 矛楯: [38], reads as follows:

> 楚人有鬻楯與矛者，譽之曰：『吾楯之堅，莫能陷也。』又譽其矛曰：『吾矛之利，於物無不陷也。』或曰：『以子之矛陷子之楯，何如?』其人弗能應也。夫不可陷之楯與無不陷之矛，不可同世而立。今堯、舜之不可兩譽，矛楯之說也。

This text can be translated as:[3]

> A man in Chu sells spears (Mao, 矛) and shields (Dun, 楯). He promotes the shields saying: "my shields are so strong that nothing can pierce them." Then he promotes his spears saying: "my spears are so sharp, that nothing can withstand them." Someone asks him: "If I use your spear to attack your shield, what will happen?" The seller is unable to answer. Therefore, unbreakable shields and invincible spears can not exist in a same world.

---

[3] translation by Kaibo Xie

Yin-Yang

> *Yin-Yang* is a pair concept in ancient Chinese philosophy. Yin and Yang are two opposite but interdependent forces in the natural world.

It is widely believed that the concept of Yin-Yang was already developed for the book of Yi (易经) [4], much earlier than the period in which the Art of War was written. For instance, Zhuangzi concludes that the book of Yi *describes Yin and Yang* [5]. According to Xu Shen, who was a philologist in the 1st century, *Yi stands for Yin-Yang.* [6].

The concepts Yin and Yang have an extensive development between the period when the book of Yi was completed and the period when the Art of War was written.

At the early stage after the two terms were created, the two words were used in religious and supernatural ways, for example: *Yin and Yang* serve as a basic pair of notions in the theory of *shudu* (数度) [7]

According to the *Record of Literary Works* of Hanshu [100], the School of Yin-Yang was good at calculating the calendars, however some followers of this school *stubbornly focus on numbers, overlook the practical matters of human-being and attribute things to supernatural powers.* [8].

Hanshu (《漢書》) suggests that the Art of War takes advantage of the notion of Yin-Yang. The *Yiwenzhi* of *Hanshu* concludes that [9]

> ...The work of Sun Tzu belongs to a discipline which...concerns both Xing (形, disposition) and Shi (勢, energy), absorbs (principles of) Yin-Yang, and makes use of tactics.

A change in meaning occurs at the end of West Zhou Dynasty: since then Yin and Yang *were interpreted as a philosophical category that explains various kinds of opposites.* [10] The new interpretation of Yin-Yang emphasizes that the two opposite forces are interdependent and can give rise to one another under certain conditions. For example, *Guoyu*(《國語》) records the speech of Fan Li (范蠡) in the 6th century BC. [11]:

> When Yang is maximal, it turns into Yin; When Yin is maximal, it turns into Yang.

---

[4] According to Xiao (1997) pp.79, The book of Yi was completed between the end of Shang Dynasty and the end of West Zhou Dynasty

[5] 《莊子・天下》:“《易》以道陰陽”. The Translation is from Watson (2013) page 288

[6] 《說文解字・卷十》:“日月為易，象陰陽也。” See [102]

[7] According Xiao (1997), the theory of *shudu* (数度, literally means *number calculation*) is the thought of the early School of Yin-Yang who believed that the foreknowledge of the world can be obtained by deductive symbolic calculation.

[8] 《漢書・藝文志》:“陰陽家者流，蓋出於羲和之官，敬順昊天，歷象日月星辰，敬授民時，此其所長也。及拘者為之，則牽於禁忌，泥於小數，舍人事而任鬼神.”

[9] 《漢書・藝文志》:“吳孫子兵法八十二篇... 權謀者，以正守國，以奇用兵，先計而後戰，兼形勢，包陰陽，用技巧者也。” See [100]

[10] See Xiao (1997), pp. 99

[11] 《國語・越語下》:“陽至而陰，陰至而陽。” See [101]

Although the terminology *Yin and Yang* was not used in Sun Tzu's book, many scientists, including Derek Yuen [79], believe that he must have known about it.

In the section about the pattern Pairs of Opposites, on page 53, we return to the connection between contradictions, Yin-Yang and the frequent occurrences of this pattern.

Contradictions and the Belief System of the Reader

When considering the logic in Sun Tzu, *The Art of War*, from a contemporary perspective, it still could be possible that there are contradictions in the text. [12]

As argued above, the meaning of contradiction was not the same in ancient China as in modern times. In addition to differences in opinion of what the definition of a contradiction is, then and now, there could also be a misunderstanding of the text due to bad translations.

Moreover, ethical or religious values of the reader can strongly influence their perception of truth in a text. For example, consider the case where "being strong", is followed by the prescription of Sun Tzu to "appear weak". However, if your belief is, that war fighters have many overlapping goals, which often include intimidating an opponent, then, *in order to intimidate an opponent, it is important to "appear strong"*. These two advices seem to give a contradiction, since "strong" and "weak" form a pair of opposites. [13]

Actually, in this case there are not two contradictory statements. There are two recommendations which seem to be an contradiction. If a war fighter believes that he should intimidate an opponent, then he is just not following the advice of Sun Tzu, who never gives this type of advice. In this case there is at most a contradiction between the text of Sun Tzu and the **beliefs** of the war fighter.

Furthermore, it is not evident that "appearing weak" and "appearing strong" represent a contradiction. When we interpret "appear" as a logical modal operator of a possibility type [14], the contradiction disappears: [15]

> "appear X" means *create an impression on your opponent which may induce him to believe that you are* X.

Under this interpretation you can present inconsistent appearances to your opponent, and if he is seduced to accept both appearances as being real, than it is even better, since you have induced an inconsistent belief in your opponent, something which will definitely damage him. As observed by Yuen [79, page 43], the use of stratagems and deception in Chinese warfare is an innovation originating from the state of Qi, where Sun Tzu was born, during the Spring and Autumn period.

Using deception goes against the teachings which can be found in the methods of Ssu-Ma (the second book in the seven Military Classics of Ancient China [59]), before Sun Tzu's time. Other authors living in another time and place may also give different advice, as we have seen in the writings of von Clausewitz, see: Books on Strategy Theory Outside China, on page 19, where stratagems and tricks must only be used as a last resort [14].

---

[12] An email discussion with professor Carl Hewitt [83], who suggests that the text of Sun Tzu needs to contain contradictions to be valuable, prompted us to look more closely at the meaning of what a Conditional Sentence is, or a contradiction, and pairs of opposites, in Sun Tzu's text.

[13] This example originates from a private communication with Carl Hewitt.

[14] Possibly P or possibly not-P.

[15] For a comprehensive text about Modal Logic, see [9].

It is not our task to decide which one is better, we just try to reveal the logic patterns behind Sun Tzu's thoughts, to enable comparisons.

Inconsistent Information

Inconsistent information is a slightly different concept from contradictory information. In a contradiction the contradictory character of the information is evident from the textual structure (A is true and not A is also true). Inconsistent information just is information which has no possible interpretation in the real world, possibly because it violates a naive law of nature or goes against common sense beliefs.

An intermediate form of inconsistent information is a *paradox*, where the linguistic structure superficially seems have no contradiction, but on closer analysis one discovers that the sentence cannot be true, as in the example of the Liar's paradox: *this sentence is false.*

There are several places where Sun Tzu refers to deliberate inconsistencies, for example by proposing deception in AoW Ch.I, par. 18-24, and by the use of doomed spies in AoW Ch.XIII.

Accidental inconsistencies may occur because the text was written over a long period of time. See Mair [46, page 29].

Do we find descriptions of how to handle inconsistent information in Sun Tzu's text? He did not have this kind of concept we believe, however his use of calculation, spy's, deception and his typical statements like in Ch. I, par. 26:

```
25. These military devices, leading to victory, must not
be divulged beforehand.
```

which follows his rules about deception, indicate that he was aware of the sensitivity of information, and the need to make it appear in different ways to different parties, such as the enemy.

Logic and Patterns

Having argued that logic was very informal in ancient China and conceptually different from how we see logic today, how can we infer the reasoning that Sun Tzu used to persuade his readers, from his text in *the Art of War*? The answer is *patterns*, see Patterns, on page 51. Sun Tzu frequently uses:

- groupings, by use of forml or informal enumerations,
- pairs of opposites, to convey Yin-Yang like logic,
- metaphors, to make a concept clear by comparison,
- and a few others.

Conditional sentences, or `if-then-else` like constructs, of which we will see much more later, also play an important role. We found that by looking at special characters, we were able to determine frequently the type of intended reasoning. The character 故 (gù) has been researched elsewhere before, for example by Mair [46]. This character provides implications in the text. Other characters, like the character 者 (zhě), indicating reversed implications, are extensively researched in this book.

This clarifies the structure of the text in new ways and led to more accurate rendering of the text in mind maps.

Patterns

Abstract Finding patters in the text of Sun Tzu's "Art of War" was an essential result of creating the mind maps. It allowed us to understand the text better and in new ways. In this chapter we will give a description of the patterns used to analyze the text of Sun Tzu.

What is a Pattern?

A pattern can be defined as *a repeated form or design*[1]. When we started looking at the text of the AoW, we found that almost in each chapter Sun Tzu was enumerating something. We also saw that he liked to use metaphors and opposing pairs. Looking more closely at these enumerations and pairs of opposites, we could see these were patterns that were used to clarify his concepts. We found in this way that there were some patterns that were used in every chapter, such as enumerations, and some that were used only twice, such as preference order. Why a preference order should be considered a pattern if it is used twice, is open for debate. We think it is a combined pattern with a very specific result, therefore it is useful to consider it as such. See Preference Order, on page 56.

For a complete list of the patterns and the places in the text where these patterns occurred, see the chapter List of All Patterns, on page 369.

Enumerations

The first and most obvious pattern we found is the **Enumeration Pattern**. In almost every chapter Sun Tzu used some form of enumeration of things or concepts, in several chapters even two. For example,

- The five constant factors in AoW Ch.I, par. 3, see: Constant Factors, on page 111.

---

[1] Taken from `https://www.merriam-webster.com/dictionary/pattern`

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- The five essentials for victory in AoW Ch. III, par. 17, see: Essentials for Victory, on page 152.
- The nine varieties of ground in AoW Ch. XI, par. 2, see: Nine Varieties of Ground, on page 301.

There are 15 explicit enumerations in Sun Tzu's book, see: Enumerations, on page 52 for an overview. As you can see, there are explicit enumerations in all chapters, except 2 and 7.

In addition to explicit enumerations, there are implicit enumerations, such as five musical notes, five colors, five tastes, in AoW Ch. V, par. 7, 8, and 9, without saying what they are, see: From Five to Infinity, on page 178.

Another example is in AoW Ch. VI, where wat the end of the chapter there is a summary mentioning five elements, and four seasons.

The use of enumerations shows that Sun Tzu found it useful to clarify his reasoning by summing up circumstances or subjects of his rules.

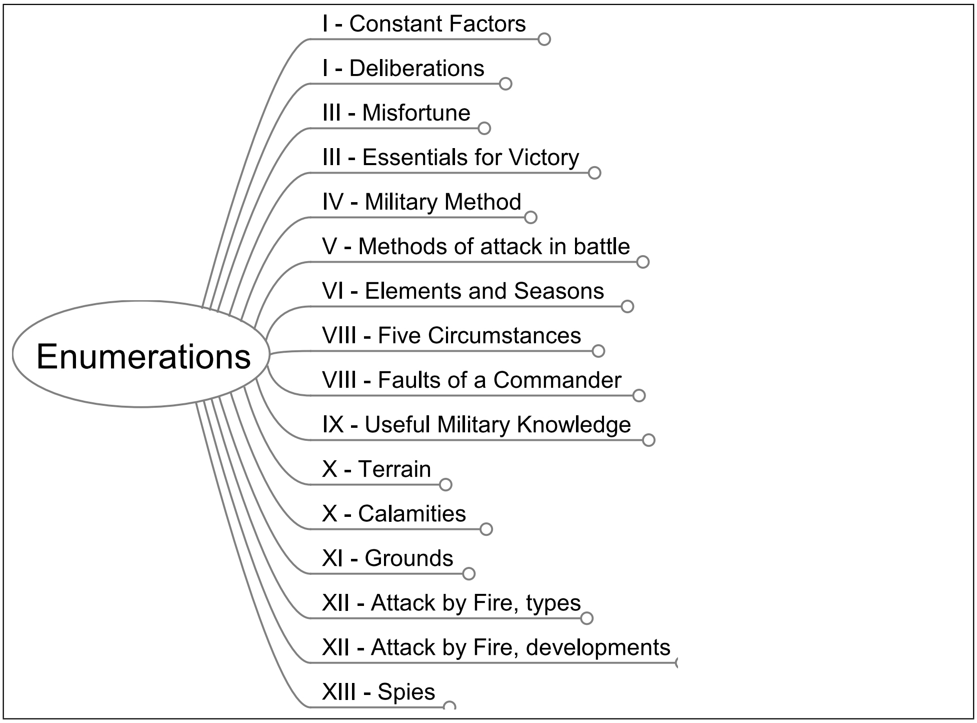
Enumerations
I - Constant Factors
I - Deliberations
III - Misfortune
III - Essentials for Victory
IV - Military Method
V - Methods of attack in battle
VI - Elements and Seasons
VIII - Five Circumstances
VIII - Faults of a Commander
IX - Useful Military Knowledge
X - Terrain
X - Calamities
XI - Grounds
XII - Attack by Fire, types
XII - Attack by Fire, developments
XIII - Spies

Fig. 13: The Enumerations

A list of the enumerations is here: Enumerations, on page 370.

Pairs of Opposites

A very different kind of grouping that occurs in Sun Tzu's book are groups of two, used as *pairs of opposites*. Although at first this seems a special case of enumerations, where there are *two* items in the enumeration, we think that the special meaning and frequent use of those pairs warrants description as a separate pattern.

Opposite pairs are groups of two items which have meaning that is opposite, for example: *able* and *unable* (Aow Ch.I, par. 19-24), *direct* and *indirect*, (AoW Ch.V, par. 5), ….

Sometimes, their use is metaphorical, for example in AoW Ch. V, par. 6:

```
° 6. Indirect tactics, efficiently applied,
  - are inexhaustible
    - as Heaven and Earth,
  - unending
    - as the flow of rivers and streams;
  - they end but to begin anew,
    - like the sun and moon;
  - they pass away to return once more,
    - like the four seasons.
```

We cannot just state that pairs of opposites are a poetical way of expressing a concept. As Derek Yuen states in his book [79, page 15],

> Paradoxes and contradictions are often expressed in the form of pairs of opposites, or polarity; yin-yang, strong-weak, offense-defense, unorthodox-orthodox, vacuity-substance, and so on and so forth. In terms of strategic thought, the use of paradox and contradiction thus denotes the use of a different logical system in the Chinese strategic tradition. As a result, Chinese strategic thought is able to provide an entirely different way of interpreting and formulating strategy.

Paradoxes and the Yin-Yang principle

In modern western logic a *paradox* is only seemingly a contradiction but not in reality. We already saw that in Ancient China this may have been different, and indeed Derek Yuen states [79, page 8]:

> What makes Chinese strategic thought even more difficult to decipher is the fact that the Chinese employ logical principles that differ markedly from the formal logic of the West. This is something which can be found in the frequent use of paradox or contradiction in Chinese military and strategic treatises.

A few pages later Yuen writes [79, page 15]:

> Paradoxes and contradictions are often expressed in the form of pairs of opposites, or polarity: yin-yang, strong-weak, offense-defense, unorthodox-orthodox, vacuity-substance, so on and so forth.

It seems that Yuen sees *paradox* as a synonym for *contradiction.*

Pairs of opposites, as Yuen notes, are a frequent style option in Sun Tzu's text. For instance, in this example, that we encountered before, see: An Example from AoW Chapter I, on page 33, in AoW Ch. 1, par. 18, Sun Tzu says: [2].

```
18. All warfare is based on deception. So,
  » when able to attack,
    ° we must seem unable;
  » when using our forces,
    ° we must seem inactive;
  . . .
```

Such pairs of opposites found in *the Art of War* can be seen as instances of the Yin-Yang principle, which has had a deep influence on Sun Tzu's text.

Hanshu (《漢書》) suggests that the Art of War takes advantage of the notion of Yin-Yang. The *Yiwenzhi* of *Hanshu* concludes that [3]

> …The work of Sun Tzu belongs to a discipline which…concerns both Xing (形, disposition) and Shi (勢, energy), absorbs (principles of) Yin-Yang, and makes use of tactics.

Also according to Derek Yuen, Sun Tzu must have been familiar with the Yin-Yang principle. It should be noted however, that Sun Tzu rejected the preliminary religious interpretation of Yin-Yang. He only makes use of the Yin-Yang principle in a philosophical sense. For instance, he clearly rejects the theory of *shudu* (数度) which claims that prediction can be made by certain deductive calculations of Yin and Yang:

AoW, Ch. XIII, par. 5

```
5. this foreknowledge
  » cannot be elicited from spirits;
  » it cannot be obtained inductively from experience,
  » nor by any deductive calculation (度).
  » 6. Knowledge of the enemy's dispositions can only
    be obtained from other men.
```

where 度 (according to the ancient commentator Zhang Yu) refers to the *shudu* (数度) theory[4].

On the other hand the thought of the Yin-Yang principle, where *two opposite forces are interdependent and can give rise to another under certain conditions*, is clearly reflected in the Art of War, for example in AoW, Ch II, par. 7:

```
7. It is only one who is thoroughly acquainted with the
evils of war that can thoroughly understand the
profitable way of carrying it on.
```

Therefore, Sun Tzu used Yin-Yang to clarify his reasoning, often with a pair of opposites, to provoke his reader.

---

[2] 《孙子兵法•始计》:“故能而示之不能，用而示之不用，近而示之远，远而示之近。” (Chapter 1, Sentence 19)

[3] 《漢書•藝文志》:“吳孫子兵法八十二篇... 權謀者，以正守國，以奇用兵，先計而後戰，兼形勢，包陰陽，用技巧者也。” See [100]

[4] 《孙子兵法•用间》：“先知者，不可取于鬼神••••••不可验于度” . And Zhang Yu Comments: “不可以度数推验而知。”, see [104] (十一家注孙子校理)

It is assumed, that by describing an important concept in the Yin-Yang way, the reader will be more easily convinced of its value, once he undertook the mental effort to understand it and acknowledge its truth.

Note that in the examples of pairs of opposites there is not really a paradox: *When able to attack, we must seem unable*, does not mean that you should **become unable**, however, you should **pretend** to be unable.

There are Pairs of Opposites in every chapter of *the Art of War*, except the last, chapter XIII. For a complete list of the *pairs of opposites* we found, see: Pairs of Opposites, on page 373.

Metaphors

A metaphor is defined as figure of speech that describes an object or action in a way that isn't literally true, but helps explain an idea or make a comparison. For example in AoW Ch. IV, par. 10:

10. So
  » **To lift an autumn hair is no sign of great strength;**
  » **to see the sun and moon is no sign of sharp sight;**
  » **to hear the noise of thunder is no sign of a quick ear.**

See: see: Excellent Victory, on page 163.

We found metaphors in almost every chapter of *The Art of War*. For a complee list of the metaphors, see see: Metaphors, on page 377.

Definitions

In some places in the text, a hybrid construction of enumerations and conditional statements is used. They are clearly meant to be definitions of a concept:

- the five *constant factors* in AoW Ch.I.
- Types of *terrain* in AoW Ch.VIII, IX, X and XI.
- Five classes of *spies* in AoW Ch.XIII.

We therefore introduce *definitions* as a separate concept. Definitions (A means B), can be formalized as **Def.**

Here is an example from AoW chapter XIII, Paragraph 7-13:

7. Hence the use of spies, of whom there are five classes:
  » (1) Local spies; (2) inward spies; (3) converted spies; (4) doomed spies; (5) surviving spies.
  ...
(1) Local spies;
  » 9. means employing the services of the inhabitants

```
    of a district.
(2) inward spies;
  » 10. make use of officials of the enemy.
...
```

Formalized: `5 Def.`

Preference Order

Preferences are conditional statements which assume a certain order in their execution. Sun Tzu uses this construct at several occasions, indicating good and not-so-good ways of performing warfare.

In logic and mathematics, *preference* is usually defined as an ordering of given elements in a set. These elements can be some objects, or possible outcomes of certain actions, and the ordering is usually defined by a utility function that weights how preferable an element is.

> *An element A is more preferable than element B if and only if A's utility is higher than B's.*

In the context of Sun Tzu, the author does not explicitly define preferences in such a rigid way. However, when multiple possible situations are articulated, Sun Tzu indeed gives them a preference order.

We call this ordering preference order for two reasons:

1. Preference relations are transitive:
   > *If A is more preferable than B, B is more preferable than C, then it implies that A is more preferable than C.*
2. They are in line with Sun Tzu's general philosophy of war. Sun Tzu is not ordering these possible outcomes randomly, but follows his own reasoning in evaluating these conditions.

The prime example for this pattern that we found is in AoW Ch.III, par. 1. The text is as follows:

```
It is better to capture a country intact,
  » than to destroy a country;
It is better to capture an army intact,
  » than to destroy an army;
It is better to capture a regiment intact,
  » than to destroy a regiment;
It is better to capture a unit intact,
  »  than to destroy a unit.
It is better to capture a squad
  » than to destroy a squad;
```

The mind map fragment for this text can be found on page 148. It will be obvious why this pattern is called *preference order*. Not so obvious, certainly not from the English translation, is that this pattern expresses a two-way preference. Not only it expresses that it is better to capture a country than to destroy a country, but also that it is better to capture a country than to capture an army and so on.

What is not stated explicitly are the preferences between the five options for destruction: If it is better to capture a country than to capture an army, then this suggests that it is also worse to destroy a country than to destroy an army. Consequently, if we take this suggestion seriously, than this famous phrase in Sun Tzu actually presents a preference order of ten elements.

For a complete list of the preference order patterns we found, see: Preference Order, on page 376.

Conditional Sentences

Abstract This chapter looks at the various types of conditional sentences in *the Art of War*. We categorized these in a set of patterns instead of a single one. Therefore these are placed in a separate chapter, together with argumentative structures, where each structure is a series of conditional sentences, together forming an argumentation with a conclusion.

Conditional Sentences

In our earlier work we described conditional sentences as a pattern in the text. However, when looking closer, we found that we are actually considering a *set of patterns*. Looking at conditional sentences in the AoW or elsewhere shows that there are many forms these can take. Consider two statements: `A` and `B`, there can be several ways to relate these. We could write:

```
if A then B,
when A then (do) B,
A causes B,
A therefore B,
B because of A,
B when A, etc.
therefore B,
thus B.
```

The last two are unusual because the conditional statement has an empty `A-part`. These frequently start in Chinese with the character 故 (gù, therefore) (gù) or 是故 (shi gù).

We call the A-part the condition, or the antecedent; the B-part is called the consequence, effect or result.

In the next sections we formalize these conditional sentence forms. in section see: Examples of Conditional Sentences, on page 61 we give some examples. A complete list of the conditional sentences we found is given here: Conditional Sentences, on page 378.

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Four Categories of Clauses

The clauses forming the antecedent or consequence in a conditional sentence are divided in four categories. We list them here, with their formalization.

1. Situations, events or conditions, describing a state of affairs leading to or determining some consequence: denoted **Cond.**
2. The resulting or entailed situation or event: denoted **Conseq.**
3. Actions describing events involving a form of (human) agency which are recommended by the author (Sun Tzu): denoted **Adv.**
4. The fourth category includes judgements, value judgements by the author (in this case Sun Tzu). These are denoted by **Judge**. In some cases the judgement is closer to a conclusion, we still denote this as **Judge.**.

Codes for Conditional Sentences

We assigned a code for each conditional sentence we found in the text. For simple Conditional Sentences we use a code of the form:

```
X => Y
```

where X and Y can be one of the four categories:

`Cond.` , `Conseq.` , `Adv.` , or `Judge.`

Aside of these four possible values the code for X can also be empty, resulting in codes like:

```
=> Cond
```

It can happen that in a Conditional Sentence either the antecedent, or the consequent, is a conjunction of clauses. In this case the conjunctions are in most cases of the same category. This is indicated in the code by prefixing the symbol with a digit. For example:

```
3 Cond => Conseq.
```

encodes an Conditional Sentence whose antecedent is the conjunction of three Conditions, and whose effect is a consequence.

Conjunctions of clauses of different types are separated by a ",":

```
Cond, => Conseq. , Adv.
```

denotes a condition implying a consequence followed by advice.

A further complication is that sometimes the clauses are negated. For conditions this means that the condition doesn't hold. However, in the case of events and actions we need to discriminate between two forms of negation: the event(action) didn't occur, or another event(action) did occur which represents in some way the opposite of the negated event(action). In order to keep our codes simple we do not denote such negations.

Another pattern is the **if-then-else construction**:

> if some condition `Cond.` holds then a first condition `Cond`$_1$ results; otherwise another condition `Cond`$_2$ results.

This can also be expressed by the pair of codes:

`Cond => Evt`$_1$`, not Cond => Evt`$_2$.

Such sentences occur in Sun Tzu, and we indicate them in the text.

Occurrences of the 故 (gù, therefore) are indicated by the symbols (故) following the code.

Examples of Conditional Sentences

Here is an example of conditions with consequences, formalized:

`Cond. => Conseq.; Cond. => Conseq.` .

AoW Ch. VI par. 3:

```
» [Advantage and Damage]
  ° 3. By holding out advantages to him,
    -  he can cause the enemy to approach of his own
      accord;
  ° or, by inflicting damage,
    - he can make it impossible for the enemy to draw
      near.
```

In the same chapter we see two judgements, formalized as:

`=> 2 Judg.` .

AoW Ch. VI par. 8:

```
» 8. Hence
  ° that commander is skillful in attack whose
    opponent does not know what to defend;
  ° and he is skillful in defense whose opponent does
    not know what to attack.
```

Further in this chapter we see some nested conditions, formalized as:

`Cond. => (Cond. => (Conseq. <= Adv.)`

AoW Ch. VI par. 11:

```
11. If we wish to fight,
  » the enemy can be forced to an engagement
    ° even though he be sheltered behind a high rampart
      and a deep ditch.
  » All we need do is attack some other place that he
    will be obliged to relieve.
```

Advice is given here about what to do when you wish to fight.

Argumentative Structures

In this section we look at argumentative structures found in *the Art of War*; more specifically we investigate whether the assertions stated by Sun Tzu are all isolated observations and/or advices, or whether some of these assertions can be grouped together in some way which will indicate reasoning by Sun Tzu.

An argumentative structure usually consists of one or more assertions and a consequence of these assertions. For example the well known assertion: *All humans are mortal*, followed by: *Socrates is a human*, therefore, *Socrates is mortal.*

The text of Sun Tzu has of a large collection of assertions, mostly statements intended to provide information on methods in warfare and recommendations on what to do in special circumstances. Frequently a set of sentences are thematically related. But that doesn't imply that they represent an argumentative structure.

Non Argumentative Examples

We start with two examples of sequences of assertions lacking an argumentative structure.

AoW chapter IX, par. 19-38

The list of ways of inferring information about the enemy based on observations about *Location* in AoW chapter IX, par. 19-38, are thematically related but there is no other form of logical reasoning connecting these assertions.

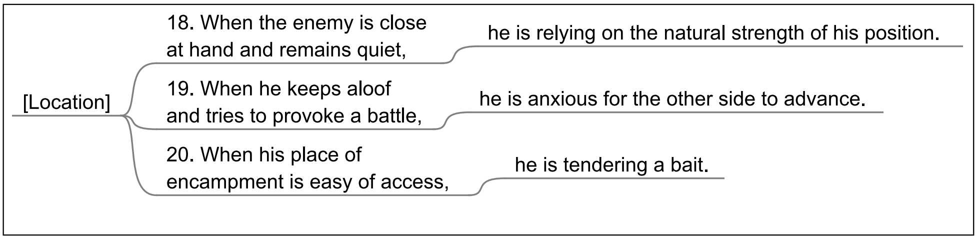

[Location]
18. When the enemy is close at hand and remains quiet,
he is relying on the natural strength of his position.
19. When he keeps aloof and tries to provoke a battle,
he is anxious for the other side to advance.
20. When his place of encampment is easy of access,
he is tendering a bait.

Fig. 14: Location, the place where the enemy can be found relative to your own position.

We duplicate a tiny part of the mind map of chapter IX here to show what form these assertions have, see figure 14.

AoW chapter I, par. 1-2

At the start of the AoW, according to the Giles translation, the importance of the art of war for the preservation of the state is a reason for it to be studied. However, the word “hence” in the second sentence is an artifact of the translation: In Chinese, this text consists of four successive thematically related assertions, therefore it is not an example of an argumentative structure.

```
The art of war is of vital importance  to the State.
  » It is a matter of life and death,
    ° It is a road either to safety or to ruin.
It is a subject of inquiry  which can on no account be
neglected.
```

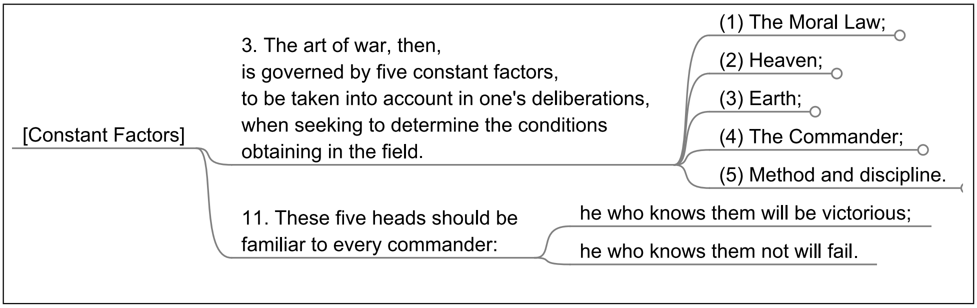
See also the section: Sun Tzu Said:, on page 111.

An Argumentative Example

We look next at an example where the assertions of Sun Tzu can be seen as an argument leading towards a conclusion.

AoW Chapter I, par. 3-4

A place where Sun Tzu seems to reason can be found in AoW chapter I, par. 3-4. Sun Tzu introduces five constant factors on which any analysis should be based. This is one of the very few places in the AoW where we changed the order of the text slightly to get a clearer mind map. See figure 15 (for clarity shown here, it is a duplicate of figure 26). Sun Tzu explains these factors in AoW chapter I, par. 4-10. For example, factor 4 in par. 9, reads:



[Constant Factors]

3. The art of war, then,
is governed by five constant factors,
to be taken into account in one's deliberations,
when seeking to determine the conditions
obtaining in the field.

(1) The Moral Law;
(2) Heaven;
(3) Earth;
(4) The Commander;
(5) Method and discipline.

11. These five heads should be
familiar to every commander:

he who knows them will be victorious;
he who knows them not will fail.

Fig. 15: Constant Factors - Overview

```
  » (4) The Commander;
    ° 9. stands for
      - the virtues of wisdom,
      - sincerity,
      - benevolence,
      - courage and
      - strictness.
```

Subsequently Sun Tzu postulates that every commander needs to be familiar with these constant factors; otherwise he will fail, see AoW chapter I, par. 11. In AoW chapter I, par. 12-13, he specifies seven topics on which the two parties should be compared. In I, 14 he observes that the answers to these seven questions enable him to predict victory or defeat; so the commander better should follow his advice, otherwise…For the mind map fragments, and for a list of the patterns found in these paragraphs, see Deliberations, on page 113.

What Makes a Structure Argumentative?

For us it is logic that determines whether the inferences in an argument are legitimate or not. For example in the logic we use today we learn that it is legitimate to infer B from A and “if A then B”, whereas it is not legitimate to infer A from B and “if A then B”.

However, such a form of logic didn’t exist in China at the time of Sun Tzu; it is an open question whether the ancient Chinese did employ in practice some form of logical rules without being aware of their formal structure.

Moreover, even in cases where there is reasoning, it may be the case that some parts of the argumentative structure are not stated explicitly.

In the example presented above, we may ask how can he conclude that every commander should be familiar with the five constant factors; the conclusion would require that it is the case that “if an analysis is based on X then every commander should be familiar with X”; this assertion is obviously true and and self evident, and therefore Sun Tzu has no need to state it explicitly.

AoW Chapter I, par. 18-22

In this section about the importance of deception, the character 故 (gù) occurs. For clarity, we show here part of the structured text:

```
18. All warfare is based on deception. So,
  » when able to attack,
    ° we must seem unable;
  » when using our forces,
    ° we must seem inactive;
  » when we are near,
    ° we must make the enemy believe we are far away;
  » when far away,
    ° we must make him believe we are near.
  » ...
```

However, the structure lists fourteen specific instances of how to deceive the enemy and recommends employing these tricks. Whether this is a truly legitimate logical inference is subject for debate, since the statement that these tricks represent, *instances of deception*, is absent (but evidently suggested by the context). [1]

AoW Chapter II, par. 1-7

In sentences 1-4 the bad impact of protracted war is described, and therefore you should avoid such a war. This is an argumentative structure, although the self-evident observation that you should shun from what is bad for you is not explicitly stated.

A quote from AoW chapter II, par. 5:

```
5. Thus, though we have heard of stupid haste in war,
  » cleverness has never been seen associated with long
    delays.
6. There is no instance of a country having benefited
from prolonged warfare.
```

AoW Chapter III, par. 4-10

In this case the arguments why you shouldn't besiege a city, are stated after the recommendation itself. See the section about Leadership: Leadership, on page 148. Again the observation that you shouldn't do what is bad for you is absent.

Here is a part of the text:

```
  » 4. The rule is, not to besiege walled cities if it
    can possibly be avoided.
    ° The preparation of mantlets, movable shelters,
      and various implements of war, will take up three whole
      months;
    ° and the piling up of mounds over against the
      walls will take three months more.
  » 5. The commander, unable to control his irritation,
    ° will launch his men to the assault like swarming
      ants,
    ° with the result that one-third of his men are
      slain,
    ° while the town still remains untaken.
  » Such are the disastrous effects of a siege.
```

The sentences 6, 8 and 10, in AoW chapter III all start with the 故 (gù) character, suggesting three consequences of the previous observations: overcome your enemy without fighting, and how to deal with different situations concerning the sizes of the two armies. Furthermore, the sad fact that in general the smaller army will be defeated by the larger one. Note that this third statement in par. 10 is another reason, rather than a consequence. The above section is evidently argumentative. See Structured Text, on page 155.

---

[1] In Game Theory and Strategic Thinking, on page 77, we will encounter an application of these deception assertions in the famous story of the Huarong pass, The Huarong Pass, on page 86.

AoW Chapter XIII, par. 1-7

A final example is the discussion about the necessity of employing spies in chapter XIII, par. 1-7. In sentences 1-3, Sun Tzu compares the cost of waging war against the cost of gathering information about the enemy, and decrees the inhumanity of attempts to scrutinize in the latter.

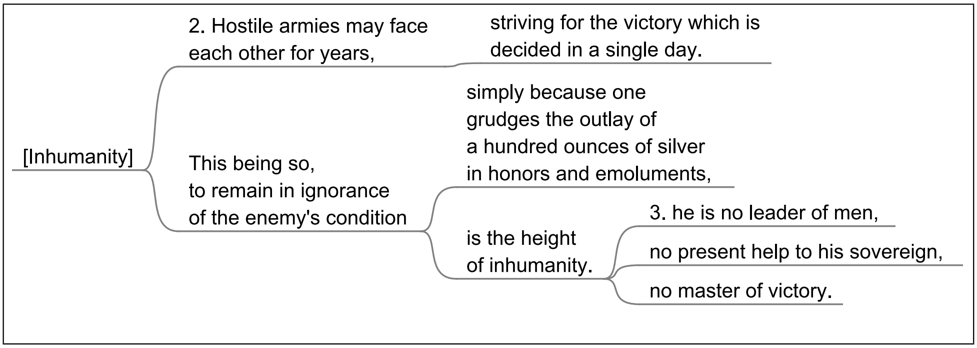

[Inhumanity]
2. Hostile armies may face each other for years,
striving for the victory which is decided in a single day.
This being so, to remain in ignorance of the enemy's condition
simply because one grudges the outlay of a hundred ounces of silver in honors and emoluments,
is the height of inhumanity.
3. he is no leader of men,
no present help to his sovereign,
no master of victory.

Fig. 16: The Reason to Use Spies, detail: Inhumanity

See figure 16 for a mind map fragment where Sun Tzu is arguing about the inhumaity of not trying to get information about the enemy.

Next he observes that information about the enemy cannot be obtained using magic, and therefore spies are needed. This is a clear instance of an argumentative structure where once again statements are missing which could show the logic of the argument. See Structured Text, on page 364.

Conclusion

We can discriminate in the text between isolated observations, and sections where sentences could be combined in a form of argumentative structure. And in the latter case we might probe whether the inference can be recognized as being logical, possibly after indicating parts of the argument which have been omitted because they are self-evident. We may conclude that there are several instances where Sun Tzu indeed is using argumentative structures. But strictly speaking, they are not logical inferences, because parts of the argument are missing.

Also, the structures stay abstract, while in most cases a more concrete situation is needed to show the conclusion of the argumentation.

This question is evidently related to the issue about the use of the character 故 (gù), which is frequently translated as “hence” or “therefore”. At first sight the occurrence of 故 (gù) is a clear indicator of an argumentative structure.

Mair refers to such constructs with the term *illative conjunctions* [46, pages 32 and following], which could be defined by:

> If a conjunction shows a statement or fact which could be inferred from another statement or fact, it is called an illative coordinating conjunction.

Mair illustrates these connections by occurrences of connectives like: “for, hence, so, thus, therefore, as a consequence, for this reason, as a result, so that, so then”, ... In our analysis we have included such sentences in the pattern of conditional sentences, which are far more frequent than the sentences including the character 故 (gù).

Mair also presents a table where he separates true and false illative conjunctions in the text by chapter. As he states, he calls an illative conjunction between phrases A and B *true*, if B is a logical or sequential consequence of A, otherwise it is a *false* illative conjunction.

The concept of logical consequence corresponds to what we have called “legitimate” previously. We assume that a sequential consequence means to be some form of a causal connection between A and B. As Mair states, there are almost no true illatives according to a strict interpretation (and grammatical analysis) in the sense of a logical consequence, which is understandable given the absence of a logic resembling the traditional logic in the sense of Aristotle in ancient China. So the table given by Mair must be based on his rather generous interpreting of the connections as being causal.

However, we should be careful with an approach which focuses on the use of this character. Mair doesn’t give any indication of the rules on which his judgement of validity (as based on causal connection) is based. In addition, in the light of the Chinese holistic approach in philosophy (see [48], everything could be connected to everything. Therefore we should ask ourselves whether it is plausible that the ancient Chinese did observe such a connection, rather than whether a connection is recognized from the perspective of a 21-st Century scholar.

We make two further remarks concerning argumentative structures:

1. Argumentative structures are less frequent in the chapters VIII - XI, which are believed by Mair [46, page 27] to be the older parts of the text.
2. There is one more pattern of a reasoning structure that we can mention: the assertion closing a list of related recommendations. This pattern occurs for example four times in succession in AoW chapter IX, where Sun Tzu presents advice on how to behave in mountains, near rivers, in salt marshes and flats. In each of those four cases the list is concluded with a closing sentence like “so much for mountain warfare”. It can be a rhetoric element, or it may have some logical intent, expressing that the listed recommendations are complete, and that other advices for these situations are non-existent or irrelevant.

The Linguistic Perspective

Abstract This chapter expands on the Patterns and Conditional Sentences chapters by giving details about our findings of the use of special characters in Chinese.

Linguistic Terminology

Because we assume that not all of our readers are expert linguistics, we define some terminology here that is used later. Our source of inspiration is: David Hornsby, Linguistics: A Complete Introduction: [31].

In traditional grammar, sentences were required to have a *subject* and a *predicate*, that is, something we are talking about (the subject) and then something said about it (the predicate). [31, page 135]

A requirement of English is that where the predicator, or main verb, is not a finite verb, the sentence requires the appropriate form of the verb *to be* for it to be grammatical: such a verb is known as a *copula*, or *linking verb*. [31, page 137].

The *pronouns* of traditional grammar were so called because they were seen as items that *stand for* nouns. [31, page 139] For example, ‘He’ can stand for ‘John’, in the following sentences:

1. John loves reading Sun Tzu.
2. He loves reading Sun Tzu.

Special Characters

Special characters such as 故 (gù, therefore) or 者 (zhě) play an important role in interpreting the meaning of a conditional sentence.

In addition, we will be looking at: 是故 (Shi-gù), 则 (zé), 凡 (fán), and 也 (yě).

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Discussion of 故 (gù, therefore)

From our look at the word-for-word translation in Zieger [82], Sun Tzu's Original Art of War, there appears to be an issue that needs to be clarified. Zieger says that this Chinese character in modern Chinese may indeed mean hence or therefore, but that in classical Chinese this word is much weaker and just means a comma, or at its best *so*. Therefore, he omits 故 (gù) in his translation.

Our investigation lets us conclude this:

- It's true that "故 (gù)" does not imply strong causal relation as in modern Chinese, but even as "so" in the weak sense, it still reveals information about the implicit logic behind the text. It is not a good idea to omit such a strong indication of a pattern completely from the text.
- Sentences containing 故 (gù) could express steps towards a conclusion, where the 故 (gù) marks the start of the description of the conclusion.

In Xizhou (1046BC - 771 BC), 故 is already taken as a cause-and-effect conjunction.

In bronze inscriptions, researchers found four appearances of 故 that clearly refer to *therefore, hence*, and *so*. In ancient written classics that recorded Xizhou inscriptions, there are also two occurrences of 故 that serve as a cause-and-effect conjunction.

Some researchers claim that sometimes 故 just refers to the next sentence, without a cause-and-effect indication. This occurs later, during the Qin and Han dynasty. This usage of 故 (gù), therefore) is also rare, while in the majority of cases 故 serves as the cause-and-effect conjunction. Shi-gù (是故) indicates strong and clear cause-and-effect relation between two sentences, and this point is a common agreement among scholars in ancient Chinese studies.

Let us look at two examples of the usage of 故 (gù) in chapter 4, in the Giles translation:

AoW Ch. IV, par. 3-4:

```
3. Thus the good fighter is able to secure himself
against defeat, but cannot make certain of defeating the
enemy.
  » 4. Hence the saying: One may know how to conquer
    without being able to do it.
```

There is a clear causal correlation with the paragraph before:

AoW Ch. IV, par. 2:

```
2.[Enemy and Ourselves]
  » To secure ourselves against defeat lies in our own
    hands,
  » The opportunity of defeating the enemy is provided
    by the enemy himself.
```

Later in this chapter there is the sentence:

AoW Ch. IV, par. 10:

```
10. So
  » To lift an autumn hair is no sign of great
    strength;
```

In Chinese this reads: 故舉秋毫不為多力. Here the use of 故 is much less directly related with the previous sentence, which states that there is no merit in easy victories.

Our conclusion is that interpreting the use 故 for causal reasoning will be mostly fine, while in some cases we do not understand well enough what was intended to be able to judge.

For more information, see the articles from *Zhigang Mao* [49] and *Cheng Zhang* [81].

Survey of the occurrence of 故 (gù) in "The Art of War"

With help of the search facility of ctext.org we could create the following table showing the frequency of occurrence of 故 in the book, adding up to a total of 102.

ch.	Title	nr. of 故 (gù)
1	Laying Plans	3
2	Waging War	8
3	Attack by Stratagem	9
4	Tactical Dispositions	10
5	Energy	6
6	Weak Points and Strong	14
7	Maneuvering	14
8	Variation in Tactics	5
9	The Army on the March	1
10	Terrain	7
11	The Nine Situations	12
12	The Attack by Fire	3
13	The Use of Spies	9

The stronger combination, 是故 (Shi-gù) occurs 16 times. There are several tables in the book of Mair [46, page 29 and following] looking at 故 (gù) and other statistics. The numbers are not exactly the same, maybe because there were differences in the Chinese source text.

Looking at the first 6 chapters, the core of chapters of *the Art of War*, the occurrence of 是故 coincides with some famous quotes:

AoW Ch. III, par. 2:

```
2. Therefore, to fight and conquer in all your battles
  » is not supreme excellence;
  » supreme excellence consists in breaking the enemy's
    resistance without fighting.
```

AoW Ch. IV, par. 15:

```
15. Thus it is that in war
  » the victorious strategist only seeks battle after
    the victory has been won,
  » whereas he who is destined to defeat first fights
    and afterwards looks for victory.
```

AoW Ch. V, par. 14:

`14. Therefore the good fighter will be terrible in his`
`onset, and prompt in his decision.`

A quick survey of the other chapters show a much less convincing pattern. Half of all occurrences (8) of 是故, appear in chapter XI, *The Nine Situations*. There are 4 more occurrences of 故 without 是 in this chapter. Why the text in this chapter contains so much more reasoning than the rest of the book would be an interesting subject of further study.

Reversed Implications, and the Characters 者 (zhě) and 也 (yě)

In chapter IX, par. 18-38, Sun Tzu presents a list of conditional statements of a rather unusual character: the roles of cause and effect are reversed.

By way of example:

Chapter IX, par. 20:

```
° 20. When his place of encampment is easy of
  access,
  - he is tendering a bait.
```

In a traditional implication: “if A then B”, it is common that A represents the cause of an event and B represents the effect. In the example above the roles of cause and effect are reversed; the conditional sentence expresses a diagnosis (B) explaining why the event (A) occurs, and therefore B represents the cause and A represents the result.

We have noticed that in the Chinese text these phrases use a noticeable structure using the characters 者 (zhě) and 也 (yě).

The Affirmative Character 也 (yě)

The presence of a conditional sentence can be indicated by the use of the character 也 (yě). In modern Chinese this means: *also, too*, however, in classical Chinese, the meaning is different: 也 ends an affirmative statement of the form:

When … it is …

For example in AoW Ch. IX, par. 28:

```
» 28. When some are seen advancing and some
  retreating,
  ° it is a lure.
```

Or, in Chinese: 半進半退者，誘也。

The character 也 (ye) is also used in ancient Chinese to express a predicative sentence. In modern Chinese, the standard pattern of a predicative sentence is “*A* 是 *B*”, where 是 (shi) is a copula, which plays the same role as *is* in English.

However, at the time of Sun Tzu, predicative sentence is not expressed with a copula, because the character 是 is not used as a copula until 1st century. Instead, a predicate sentence:

> "A is B" is usually expressed by the pattern "*A* 者，*B* 也".

In ancient Chinese, each of A and B in the pattern "*A* 者，*B* 也" can be a complex term that stands for a situation. When A and B are two terms standing for two situations, the sentence "*A* 者，*B* 也" literally means "situation *A* is situation *B*". It can be used to express situation *A* is a sign of situation *B*.

There are many instances of this pattern in the Art of War. For instance, in Chapter IX, the sentence "汲而先饮者，渴也" is of the form

> *A* 者，*B* 也

A is a situation 汲而先饮 (those who are sent to draw water begin by drinking themselves), and *B* is another situation: 渴 (suffering from thirst).

AoW ch. IX, par. 30:

```
» 30. When those who are sent to draw water begin by
  drinking themselves,
  ° the army is suffering from thirst.
```

So, the literal meaning of 汲而先饮者，渴也 is: The situation that *those who are sent to draw water begin by drinking themselves* is a situation that *the army is suffering from thirst.*

The Role of the Character 者 (zhě)

It has long been an open question about the role that the character 者 plays in sentences of the form *A* 者，*B* 也 in pre-Qin period.

There are some theories about ancient Chinese grammar which take 者 as a particle in this structure. According to this theory, 者 has no meaning in this sentence. According to these theories, 者 needs to play different grammatical roles, depending on what A and B are. For instance, when A is an adjective or verb phrase, then 者 is a nominalizer that turns A into a noun, so that it makes sense to say A is B or A has the property B. This interpretation is defended by Zhu Dexi [37].

However, there are also cases in which the A in the structure *A* 者，*B* 也 is not an adjective/verb-phrase; for instance it could be a noun or a sentence, and therefore in this case 者 can no longer been understood as a nominalizer. According to the theory, in this case, the function of 者 is to indicate the grammatical information that the whole sentence is an assertion.

The book Mashiwentong 马氏文通 [1] even indicates that in such a case, the function of 者 is only to separate clauses.

---

[1] Mashiwentong is the first grammar of the Chinese language written by a Chinese scholar in the 19th century. It has a big influence on Chinese linguistics in 20th century, though it is criticized by many of the latter as a book imitating Western grammar and imposing the Western grammatical tradition on Chinese.

There is another theory on the meaning of 者 proposed by Wang Li [76, 77] who is one of the most influential Chinese linguists in 20th century and known as the founder of Chinese Linguistics.

He proposed a uniform way to account for the role that 者 plays in sentence of the form *A* 者，*B* 也. His theory is that 者 is a pronoun in such sentences.

When A is an adjective, 者 is a pronoun which is equivalent to “the person who” or “the thing that”, so *A* 者 is a still a noun phrase in this case. When A is a noun, 者 is a resumptive pronoun meaning *this person* or *this thing* described by A.

If A is a sentence, then 者 is a pronoun [2] referring to *such a situation* described by A. [3]

It should be mentioned that there are also many modern criticisms on Wang Li’s theory, which deny that there is any uniform point of view for the meaning of 者 in sentences of the form *A* 者，*B* 也. According to some criticisms, the structure *A* 者，*B* 也 only indicates some kind of relation between A and B; the relation could be descriptive, causal, explanatory, or even illustrative, depending on the context. Then the question becomes a matter of pragmatics.

We are in favor of Wang Li’s point of view. Instead of considering 者 to be a nominalizer, in our analysis of Chapter IX in the Art of War, we assume it is a pronoun.

Each of the sentences in the last part of Chapter IX is of the form *A* 者，*B* 也, but the phrases at the position of A, are very different from sentence to sentence in this part of the book.

For instance in the sentence 数赏者，窘也，数赏, meaning *Too frequent rewards* is a verb phrase. Here 者 could be seen as a nominalizer. In the sentence 鸟集者，虚也, the A part 鸟集, meaning *birds gather on any spot*, is a sentence, but a sentence cannot be nominalized. This would require that the logic structure of the two sentences are different.

But if we understand 者 as a pronoun, then 者 plays the same role in the two sentences. The only difference is that in the first sentence, 者 means *such an enemy*, and in the second sentence 者 means *such a situation*. According to this explanation, the logical structure of these sentences are equal: the difference is only their content.

Though the two approaches coincide with each other in the meaning of the whole sentence, they analyze the structure in different ways. We prefer an explanation according to which the sentences in Chapter IX of the form *A* 者，*B* 也 have a unique logic structure. Since Sun Tzu places all those sentences together, it is reasonable to assume that they should share the same logical structure.

If 者 is actually a pronoun in the sentence *A* 者，*B* 也, then from a logic perspective of view, it is natural to think of 者 as a variable. According to this interpretation, the sentence *A* 者，*B* 也 should be interpreted as: for any X that is a case of A, X is a case of B. So the underlying meaning of 数赏者，窘也 is actually: for any enemy who frequent rewards, this enemy is at the end of his resources. And the underlying meaning of 鸟集者，虚也 is actually: for any case that birds gather on any spot, it is a case that the terrain is unoccupied.

---

[2] more specifically: a resumptive pronoun

[3] for more about Wang Li’s argument on this issue, see his book The history of Chinese Grammar. This point of view is also reflected in the Wang Li Character Dictionary of Ancient Chinese and Ancient Chinese (the most widely used contemporary text book for ancient Chinese).

The only reason why we do not translate the sentences in this way is that it is unnatural in English to express sentences like this. which involves to connect two complex terms, both describing a situation, by a copula. Instead, we can express it in a conditional form:

if *A* 者 then *B* 也

or, as in an example that we already saw:

AoW ch. IX, par. 30:

> » `30. When those who are sent to draw water begin by drinking themselves,`
> `° the army is suffering from thirst.`

When *A* 者，*B* 也 is interpreted as a conditional `if` *A* `then` *B*, then it is a *backtracking* implication, in which the situation *A* is a sign of (and usually caused by) the situation *B*.

It should be noted that *A* and *B* are not symmetric in the pattern *A* 者，*B* 也, unless the pattern expresses an identical relation between *A* and *B*. Switching *A* and *B* in the predicative sentence *A* `is` *B* will change the clause's meaning, unless it expresses an identical relation between *A* and *B*.

So when *A* 者，*B* 也 is interpreted as `if` *A* `then` *B*, it can only be the case that *A* is the sign of *B*, but cannot be the other way around.

Other Special Characters

Other special characters that are useful in considering the structure of the text, are: 凡 (fán) and 则 (zé).

The Universal Quantification 凡 (fán)

There are 9 chapters in *the Art of War* where the character 凡 (fán) occurs in the first paragraph. It indicates the importance of this character to outline the contents and statements in each chapter. Each occurrence of 凡 (fán) indicates a universal truth that Sun Tzu want to convey to his reader, most often at the start of the chapter, but sometimes to conclude a subject or to start a new subject. In total there are about 22 occurrences of 凡 (fán).

The character 凡 fán is used as a Universal quantifier:

- All A are B, or,
- in all circumstances B holds.

Although these phrases are syntactically not a Conditional Sentence, they have comparable semantics:

`if you are an A then you are a B`.

The Character 则 zé

The character 则 zé indicates some contrast between two phrases:

`A but B`.

Our research on this subject is certainly not complete. Looking at special characters like 故 (gù) or 是故 (shi gù), 也 (ye), 则 (zé), 者 (zhě), and 凡 (fán), in more detail than we did thus far, we could uncover new patterns and possibly a new meaning of the text.

Game Theory and Strategic Thinking

Abstract We describe the role of Game Theory and how this relates to Strategic Thinking in Sun Tzu's work. First, we answer the question why game theory is relevant in this book, then we give a very short overview of game theoretic principles. We look at various examples, and finally we turn our attention to theory of mind and the question whether Sun Tzu could have used it consciously.

Releasing Cao Cao at the Huarong Trail

Sun Tzu, War and Game Theory

The first serious research of Sun Tzu's *Art of War* related to game theory was done by Niou and Ordeshook [52], who claim that Sun Tzu came very close to understanding game theoretical concepts as we know them today. We will build upon their work, borrowing several examples and discussing their opinions. But we give first a short introductyion to the relevant game theoretical concepts.

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To modern logicians, the discipline of logic is very much intertwined with game theory. On one hand, logic is used to advance game theories and on the other hand, game theoretic principles are used as a tool-set in logic research. Therefore, it is an understandable assumption, that in a book with *logic* in its title, we should look at the game theoretical aspects of *the Art of War*. [1]

We can approach war also from another angle: if we are considering war, then can we usefully consider game theory also? Indeed, in a war, there are two or more parties, and we assume that each party wants to win the war. Therefore, war is a game. As in any game, there are *players*, *moves*, *strategies* and *outcomes*.

Unlike a chess game, or a contemporary war game on a computer, there are no clear rules in a real war. It is not always certain who the players are, rules may be different for each player, and it may even be uncertain which party has won, or when the war has ended. Therefore, it is difficult to model war as a game with classical game theory, where common knowledge of the rules of the game are a requirement

We reasoned in our introduction about Sun Tzu's logic, that at his time logic was very informal. Similarly, our description of the game theoretical aspects of *the Art of War* will be informal. [2]

Aside from understanding a situation in a war, and possibly using a game theoretical analysis for this situation, we should keep in mind that different mindsets exist in our world, as compared to Ancient China. According to François Jullien, *A Treatise of Efficacy* [39] the Western concept of action goes back to the Greek concepts of aiming at achieving goals by direct intervention. Instead, the Chinese prefer to let the situation develop, waiting for the right moment to take the appropriate action.

By way of example, where Vegetius [72, 73] describes tactics which enable to force a gap in the enemy's front, his Chinese colleague will manipulate the situation in order to let the enemy create a weak spot in his front line, and subsequently will attack at that precise point.[3]

Game theory can be defined as the *theory of agents in strategic interaction*, which means that strategy studies about warfare are game theory studies. In this way, many other studies on strategy, including the works of Thucidides [67], Machiavelli [45], and von Clausewitz [14] can be considered to be game theoretical studies, and the same holds for the work of Sun Tzu.

For more information on the long history logic and games have together, see for example *Logic and Games* [30]. For a theoretical background of the connection between games and logic see *Logic in Games* [5]. [4]

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[1] The role of mind maps may not be immediately apparent here. What can be said is that they helped to find text that describes strategy, and that they made it possible to show this text in a clear way.

[2] Although it would have been possible to show mind map fragments for all examples here, for practical reasons we have chosen to use structured text instead, for some examples. If we use structured text, we give a reference to the appropriate mind map fragment appearing in part 2 of this book.

[3] We are grateful to one of our reviewers for pointing us to Julliens book

[4] In the Handbook on the History of Logic in China [69] we published a chapter: *The Rules of Victorious Warriors*, covering logical and game theoretical aspects of strategy theory in ancient China. We use part of that material here to be able to tell a complete story.

We describe here some principles of Game Theory, in so far as it is applicable to warfare and Sun Tzu. A general very short introduction can be found in Ken Binmore's *Game Theory: A Very Short Introduction* [7].

In a *game* there are: *Agents* or Players, *Actions* or Moves, *Strategies* or complete plans on how to move throughout the game, *Outcomes* or positions where the game ends, and *Preferences and Utilities*, expressing what players desire.

The key idea is that players select actions according to some strategy which tells them which action they should perform given the state of the game. Starting from an initial situation, controlled by these actions, the game traverses a sequence of intermediate states, terminating in a final state called the outcome of the game.

The preferences of the players indicate which outcomes are desired by which players. A standard way of expressing preferences is assigning to each outcome a numerical value called the *utility*; a higher utility value indicates that the outcome is preferred. It is assumed that players will aim for a more preferred outcome as far as it is in their power to do so: the players are *rational*.

Furthermore one should discriminate between two kinds of games: *Extensive games* are games where there are intermediate stages: players move in turns, starting in the intial position, until a terminal position is reached; in most cases in a transition only a single player moves. Traditional board games are examples of extensive games. A convenient way of representing such games is using a graph theoretical representation of the sets of possible positions and moves (the game configuration graph, or more specifically a game tree).

In a *Strategic game* there is only an initial position and all other positions are terminal. All players move simultaneously and their combined actions determine the outcome. A preferred way of representing such a game is the game matrix (for the case of two players) where the rows and columns of the matrix represent the strategies available for the first and second player, and the matrix element is a pair of numbers representing the utilities of the two players when the strategies indicated by the row and column are chosen.

For the purpose of this chapter it suffices to use the model of strategic games.

In the examples of most Game Theory books, depending on the research field of the authors, the players are called Bob and Alice (traditional in Computer Science literature), or Eloise and Abelard(by logicians); they are playing simple and rather artificial games like *Chicken*, or *the Prisoners Dilemma* [7]. In this chapter, the players will be called *Sun Tzu* and *the Enemy* (or more specifically the King of Ch'u), while the game we are contemplating will be *war*. However, some aspects of war as described by Sun Tzu can resemble one of those artificial games, and we will refer to them when appropriate.

Solution Concepts

Solution concepts are tools for understanding how a particular game should be solved: which of the available strategies one should recommend to a player involved in the game.

Important notions in game theory are the concepts of dominant- and dominated strategies. These are the solution concepts which are the easiest to understand. A *dominant strategy* is a strategy which is optimal regardless of strategy of the other player. A *dominated strategy* is a strategy which is dominated by another strategy; in all instances it generates a suboptimal outcome and a fixed alternative would yield a better outcome. When one strategy is dominant, other strategies are either dominated (or at best as good as the dominant strategy). A player can have a dominated strategy in a game even if there is no dominant strategy.

It is clear that when a dominating strategy exists, such a strategy should be selected, also a dominated strategy is one which whould be avoided in all circumstances.

When there is no dominating strategy it becomes more difficult to recommend the selection of a strategy. It can be the case that a strategy is the best possible one against some counter strategies, whereas there are other counterstrategies against which a better alternative exists. For example in some geographical situation it is advisable to take up a defensive position against an attacking enemy, but in doing so one misses the opportunity to pursue and obliterate the enemy if he is intimidated by your position and flees the battlefield without fight.

Analyzing whether such a nondominating strategy should be used or not requires thinking about the perspective of the enemy. It may be the case that the enemy has no dominating strategy either. In such a situation it is possible that a so-called *Nash Equilibrium* exists. This is a combination of strategies for all players (a so-called *strategy profile*) such that no player can obtain any advantage by deviating and following another strategy. Such a Nash equilibrium strategy (if it exists) can be safely recommended to all participants; if the enemy folows the recommendation also you are safe and if he deviates, so the worse for him (with some potential benefit for you as well).

More problematic are strategies which are not the best response to any counter strategy; it is still possible that such a strategy may be recommended, as is the case with the concept of the *Maximin* strategy defined below.

Minimax and *Maximin* strategies are standard concepts in Game Theory.

- The *Maximin* strategy is used when the player considers for each of his possible actions the outcome resulting from the most unfavourable choice of actions by the opponents; next he selects an action maximizing the utility of the outcome obtained in this worst case scenario.
- The *Minimax* strategy is similar but one argues based on the possible actions of the opponents: for each action of the opponents the player determines what will his result when he chooses his best possible counteraction; next he assumes that the opponents will select strategies in such a manner that the resulting pay-off will be minimal.

It is evident from the definition that the Minimax stratergy is a best response against at least one counterstrategy (the one which minimizes the best outcome for the player) but this is not necessarily the case for the Maximin strategy since that is focussed on damage prevention. There is a class of games where the two solution concepts Maximin and Minimax yield equal results: the class of zero sum (or more generally constant sum) games. These are games between two players where the utility of the first player is the negative of the utility of the second player (possibly modified by an additive constant). These games represent the adagium that the enemy's losses are my profits.

For constant sum games minimizing the maximal damage you can suffer by an opponents move is equivalent to maximizing your minimal gain against possible opponents moves: therefore Maximin = Minimax. In this situation the Maximin = Minimax solution yields automatically a Nash equilibrium as well. However, for general games the concepts are not equivalent. See for example Binmore, chapter 6 [8].

Warfare in general can be considered by approximation to be a zero-sum or constant-sum game: the gain of one party equals the loss of his opponent. This is not entirely correct: even the party who wins the war will have suffered some dammage. However, the approximate description is useful since in such a game always an equilibrium exists: the so-called Minimax strategy.

Finally we must mention the *Probabilistic aspects* of a game: There are two different aspects where probabilities can be relevant: In the first place it may be the case that the result of an action (or a simultaneous set of actions) may be a stochastic event, for example when the action involves throwing dice or doing a coin flip. The result of an action also may be impossible to predict exactly; E.G., the number of enemy soldiers killed in an attack. The second aspects where probabilities are relevant are the so-called *mixed strategies*: the players select from a given set of actions according to a fixed probability distribution.

An important classic result from Game theory is Nash' theorem which states that for general strategic games a mixed strategy Nash equilibrium always exists; see theorem 7.7.1 in Binmore [8].

Niou and Ordeshook on Dominating strategies Used by Sun Tzu

Niou and Ordeshook [52] present several examples of recommendations which they consider to be instances of *dominated Strategies* or *dominant Strategies.* For example in AoW Ch. VIII, Nine Variations, there are rules about types of ground, see figure 17.

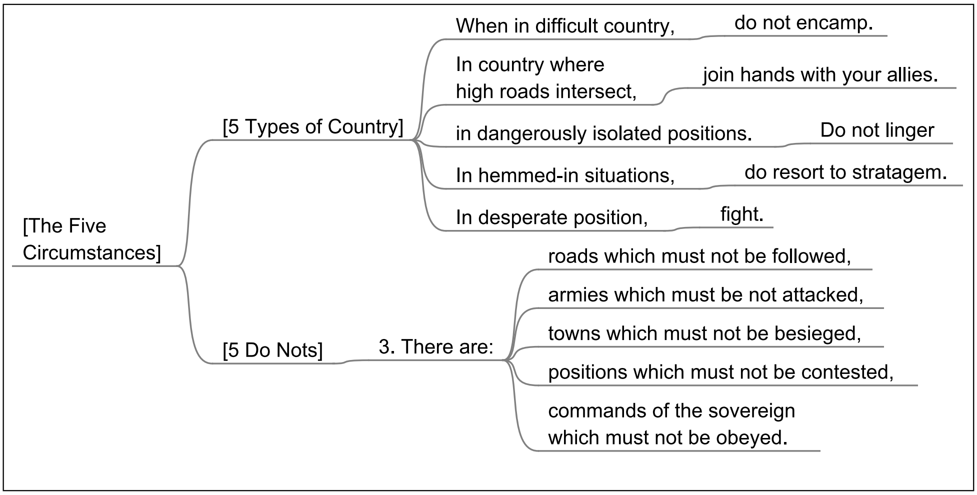

[The Five Circumstances]
[5 Types of Country]
When in difficult country,
do not encamp.
In country where high roads intersect,
join hands with your allies.
in dangerously isolated positions.
Do not linger
In hemmed-in situations,
do resort to stratagem.
In desperate position,
fight.
[5 Do Nots]
3. There are:
roads which must not be followed,
armies which must be not attacked,
towns which must not be besieged,
positions which must not be contested,
commands of the sovereign which must not be obeyed.

Fig. 17: 5 Circumstances

These rules describe tactics one should always use in given circumstances, in which case it is a *dominant strategy.* or describe errors one should never make, in which case it is a *dominated stragety.*

Niou and Ordeshook denote these rules for the first three types of country as *dominated* and the last two as *dominant*, but we find this characaterization rather problematic.

The problem is the word **not**: Negating an action can mean two different things: not doing the action or doing something which is in some sense the oposite of the action.

In the later case the alternative is this opposite action and it is evident what action is recommended. But in the first case there is in general no specific alternative action which is proposed.

So if you consider *When in difficult country, do **not** encamp* as a rule, then it can be seen as a *dominant* strategy, when one realizes that there is just one alternative for encamping: marching on. In this case *do encamp* would represent a dominated strategy.

The third line similarly advises a negated action (do not linger) where the alternative is marching on.

The second, fourth and fifth line present positive actions, which indeed could be seen as dominant strategies, aside from the fact that in line 4 there is no indication which strategem to resort to.

```
     ° In encircled situations,
      - do resort to stratagem.
```

In this case it is not apparent that there is a strict rule to follow, therefore this advice implicitly refers to the *dominated strategy* of not doing anything.

Another examples is found in AoW Ch. IX, The Army on the March, one of the chapters that provide rules for fighting on various types of ground: [5]

```
[River Warfare]
  » 3. After crossing a river, you should get far away
    from it.
  » 4. When an invading force crosses a river in its
    onward march,
    ° do not advance to meet it in mid-stream.
    ° It will be best to let half the army get across,
      - and then deliver your attack.
  » 5. If you are anxious to fight,
    ° you should not go to meet the invader near a
      river which he has to cross.
    ° 6. Moor your craft higher up than the enemy,
      - and facing the sun.
    ° Do not move up-stream to meet the enemy.
```

Here we see the dominated strategy of meeting your enemy mid-stream, and a dominant strategy advising to attack an invading army when it is half way crossing a river.

The line between a dominated and dominating strategy is in these cases dependent on how the rule is defined or understood by the player and maybe rather subjective.

There is one more problematic aspect of the rules like the ones given in the above examples: should they be followed always or should they be understood as *default rules*, which should be followed if nothing unusual occurs; otherwise, exceptions would be allowed. Given the way Sun Tzu writes about the orthodox and non orthodox methods (also called direct and indirect methods) in AoW Ch. V, we are inclined to understand rules in Sun Tzu to be default rules, in which case no strategy recommended by a rule can be dominant in the mathematical sense.

---

[5] For the mind map fragment of this text, see figure 99, River Warfare, in the second part of this book.

Minimax Strategy Used by Sun Tzu

Niou and Ordeshook present an analysis why it would be unreasonable to expect that Sun Tzu could have arrived at an equilibrium concept like the Nash equilibrium. Sun Tzu misses the required form of circular reasoning about the opponent reasoning about himself etc. This is directly linked to the absence of an explicit reference to *theory of mind* reasoning, that we will look at in the next section.

However, there exist special cases where the reasoning of Sun Tzu will amount to recommending an equilibrium strategy, and that is in the cases where the minimax strategy yields an equilibrium as is the case with constant sum games.

Some rules of Sun Tzu can be interpreted as recommendation to minimizing your own loss assuming the worst case counter strategy of your opponent. See for example chapter 4 in the section on Good Fighter Qualities: [6]

```
The good fighters of the past first put themselves
beyond the possibility of defeat,
and then waited for an opportunity of defeating the
enemy.
2.[Enemy and Ourselves]
  » To secure ourselves against defeat lies in our own
    hands,
  » The opportunity of defeating the enemy is provided
    by the enemy himself.
3. Thus the good fighter is able to secure himself
against defeat, but cannot make certain of defeating the
enemy.
  » 4. Hence the saying: One may know how to conquer
    without being able to do it.
```

Mixed Strategy Used by Sun Tzu

As an example of *Mixed Strategy*, found by Niou and Ordeshook, consider this quote concerning *Tactical Dispositions* from AoW Ch. VI, par. 25-29: [7]

```
  25. In making tactical dispositions,
  » the highest pitch you can attain is to conceal
    them;
  » conceal your dispositions, and you will be safe
    ° from the prying of the subtlest spies,
    ° from the machinations of the wisest brains.
  » 26. How victory may be produced for them out of the
    enemy's own tactics
    ° that is what the multitude cannot comprehend.
  » 27. All men can see the tactics whereby I conquer,
    ° but what none can see is the strategy out of
      which victory is evolved.
```

---

[6] For the mind map fragment of this text, see figure 48, Good Fighter, in the second part of this book.

[7] For the mind map fragment of this text, see figure 73, Tactical Dispositions, in the second part of this book.

» 28. Do not repeat the tactics which have gained you
  one victory,
  ° but let your methods be regulated by the infinite
    variety of circumstances.

Sun Tzu states that you should never repeat yourself; Niou and Ordeshook recognize this as the concept of a *Mixed Strategy.* In a classical game-theoretical sense, this should mean that Sun Tzu would use a random strategy, like throwing dice, to establish his next move. This seems rather unlikely, considering his contempt for oracles. On the other hand Sun Tzu explicitly recommends to be variable in your choice of strategy. He connects this with the concepts *chen* (orthodox/expected/direct) and *ch'i* (unorthodox/unexpected/indirect). But also in this context he never explicitly refers to the strategic reasoning of the opponent. And a variable behaviour is not necessarily random behaviour.

Here is an example of the way Sun Tzu uses orthodox and unorthodox methods, from AoW chapter V: [8]

5. In all fighting,
  » the direct method may be used for joining battle,
  » but indirect methods will be needed in order to
    secure victory.
...
10. In battle, there are not more than two methods of
attack
  » the direct and the indirect;
    ° yet these two in combination give rise to an
      endless series of maneuvers.
  » 11. The direct and the indirect lead on to each
    other in turn.
    ° It is like moving in a circle--you never come to
      an end.
    ° Who can exhaust the possibilities of their
      combination?

This text in the AoW immediately follows a text we have seen earlier, in the section Famous Quotes, on page 37, where it is argued that even limited means can give unlimited possibilities, like the possibility of mixing an unlimited amount of hues of color from just five ingredients. The sentence above is the application of those previous *From Five to Infinity* examples to a battle situation, implying that also here there are an infinite number of choices or possibilities, as in determining the best tactic in a recursive choice situation.

Common Knowledge

In game theory it is customary to assume several characteristics for the game and the players:

- *Common Knowledge of the Game and its rules*: Agents know the structure of the game and they know which moves are possible in which states, both for themselves

---

[8] For the mind map fragment of this text, see figure 58, Direct and Indirect, in the second part of this book.

and for their opponents. They know that the opponents have the same knowledge, and that they know that we know it as well (in fact common knowledge entails an infinite collection of nested statements of the form *I know that you know that I know that....*).
- *Common Knowledge of Preferences and Utilities*: the players not only know their own preferences but also those of their opponents, and are aware of the fact that the opponents know their preferences as well (again up to arbitrary depth).

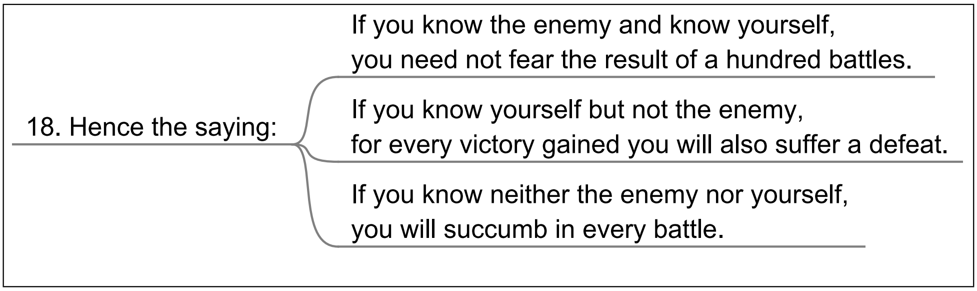
One can doubt whether these assumptions are reasonable, particularly in the context of warfare. Common knowledge of the game would require that all parties are fully informed about all aspects of the terrain and have full knowledge about the composition and strengths of the opposing army. Secret weapons would not be allowed. Common knowledge of the utilities would require that parties have complete information on the policies and internal affairs of the enemy. Under these assumptions spying would be futile.

Some game theorists, for example Niou and Ordeshook [52], precisely for the above reason, hesitate to consider the writings of Sun Tzu as conforming to game theoretical concepts, because there is not a set of rules which are considered common knowledge for both parties. Actually, there are many games, recognized by everyone as real, that do not adhere to these rules either, due to reasons of limited cognitive capacities of the players. Even for a game like Chess, where it is theoretically possible that both players know the best next move, this is unrealistic in practice.

One may ask whether the results of game theory can be preserved without these unrealistic assumptions. One approach is to use features in game theory (incomplete information and probabilistic moves) which represent uncertainty to model the ignorance of the players. The problem is that only known ignorance of the players can be modeled it in this manner. An alternative is to relax the assumptions in game theory themselves. Löwe et. al. [43] show that game theoretical analysis is possible without assuming common knowledge of the utilities of the players. Halpern and Rêgo [28] present a version of game theory where no common knowledge of the game structure is required.

If we constrain ourselves to a definition of game theory, stating *analysis of strategies for dealing with competitive situations*, then, *war* is a game and Sun Tzu's analysis of war strategy is game theory. It is therefore understandable that many business researchers did not bother too much about being able to find the right game theoretical background. How far we can go while using one of these more extended and liberal interpretations of Game Theory is a subject for future research.

Sun Tzu evidently recognizes the importance of knowing your opponent, as illustrated by the famous quote from chapter III, see figure 18.



18. Hence the saying:

If you know the enemy and know yourself,
you need not fear the result of a hundred battles.

If you know yourself but not the enemy,
for every victory gained you will also suffer a defeat.

If you know neither the enemy nor yourself,
you will succumb in every battle.

Fig. 18: Hence the saying

Theory of Mind

Niou and Ordeshook [52] concluded at the end of their paper:

> The thesis of this essay is that he can be credited with having anticipated the concepts of dominant, minimax and mixed strategies but that he failed to intuit the full implications of the notion of equilibrium strategies. Thus, while he offers a partial resolution of the 'he-thinks-that-I-think' regresses, his advice remains vulnerable to a more complete strategic analysis.

The *he-thinks-that-I-think* regress is today better known as the *theory of mind* concept. It is a concept originating from the field of Psychology, defined as:

> *Theory of Mind* (often abbreviated as ToM) is the ability to attribute mental states: beliefs, intents, desires, pretending, knowledge, ..., to oneself and others. Also important is to understand that others have beliefs, desires, and intentions that are different from one's own. In Game Theory, the use of *Theory of Mind* is more focussed toward the concept of reasoning from the standpoint of another person.

Although Niou and Ordeshook gave us little hope of finding new evidence of ToM reasoning by Sun Tzu, there are still interesting observations to make and we can try to find out how close he, or the people following his advice, came to conscious theory of mind reasoning.

Let us look at an example from Chinese literature.

The Huarong Pass

A peculiar event in the Romance of the Three Kingdoms, a novel written by Luo Guangzhong in the 14th century, describes an ambush staged at the Huarong pass. The period of the Three Kingdoms is much earlier, from about 168 AD to 280 AD. [9]

> The ambush was intended for the army of Cao Cao while he retreated after he lost the battle at Red Cliffs in the year 208 AD. Cao Cao had the choice of taking the arduous Huarong pass trail or to take a longer valley road:
>
> The ambush is staged by commander Guan Yu (Lord Guan), who implements a strategic plan designed by Zhuge Liang (Kongming).
>
> In this story Zhuge Liang orders Guan Yu to expose the location where he intends to ambush Cao Cao by setting up a bonfire.
>
> Zhuge Liang correctly predicts that Cao Cao will assume that this bonfire is a ruse to lead him into an ambush located along the valley road, and consequently Cao Cao chooses for the mountain road and walks into the trap.

---

[9] The story here is based on the text in the book *Three Kingdoms* [35, Vol 2, page 584 and 592]; although the battle at Red Cliffs is a historic event, the episode of this ambush is presumed to be a legend.

> Cao Cao survives the ambush due to the fact that Guan Yu, under obligations under the warrior code involving past events, does not kill him but only humiliates him, and provides him with a free retreat.

The game theoretical relevance of this story, and the connection with Sun Tzu's Art of War is evident, when we consider that both parties refer to deception tactics as presented in AoW Ch. I, par. 18, of *the Art of War*, which reads (see 29 for the mind map fragment): [10]

```
18. All warfare is based on deception. So,
  » when able to attack,
    ° we must seem unable;
  . . .
  » where you are not expected,
    ° appear.
```

Cao Cao assumes that his opponent is using the tactics *appear strong where you are weak*[11] and uses his observation in order to explain why he chooses for the mountain road. But, Zuge Liang takes it one step further than Cao Cao. He invokes in fact a strategy *appear strong where you are strong*, a strategy which goes in fact against Sun Tzu's teachings, but which represents a counter strategy against the strategy recommended by Sun Tzu. Therefore Cao Cao really walks into the trap.

The example shows that Cao Cao is using 2nd order, or one-step theory of mind, while Zuge Liang was using 3d order, or two-step theory of mind. And note that the issue at stake is not whether Zuge Liang will stage an anbush but where he will put it.

Actually, what this example shows is that *appearing strong where you are weak* as Sun Tzu seemingly advises, is an advice which should *not* be followed blindly. What matters is calculating the chance that the enemy is showing his true strength. And performing this calculation requires theory of mind.

Strategic Calculations

We should make an explicit distinction between the concrete example in the Romance of the Three Kingdoms and the abstract work of Sun Tzu.

Sun Tzu talks about an army which *should appear* to be weak when it is strong, but he does not discuss the situation from the perspective of the enemy. It should be the judgement of the other party to decide what he sees of his enemy is true or not.

By assuming that Zhuge Liang is following the advice without evaluation, Cao Cao is not taking the uncertainty of *appears* into account. If Cao Cao had considered that, he might have made another choice. Also (in AoW Ch. VII par. 35), Sun Tzu warns you, in one of his military axioms: `Do not swallow bait offered by the enemy`.

Using modern game theory principles, Cao Cao should have considered how likely it was that Zuge Liang would try to ambush him in the valley. If his conclusion had been that there was a larger than 50% chance that the bonfire set up by Zuge Liang was a deception, then he should have taken the valley road instead of the Huarong pass.

---

[10] We have seen this example in section An Example from AoW Chapter I, on page 33.

[11] although this instance of deception fits the pattern of Sun Tzu's advice, it is not stated verbatim among the 14 examples of deception in chapter I, 18.

Notice that there is no certainty of what the best road is, only the psychological assessment of Zuge Liang by Cao Cao can be taken into account.

As a side note, maybe Sun Tzu would not have been forced to make the choice Cao Cao had to make, since he would never have lost the battle at Red Cliffs before! This is because Sun Tzu writes in Ch. IV, par 14: (see figure 51 for the mind map fragment).

```
    » 14. So the skillful fighter puts himself into a
    position which makes defeat impossible, and does not
    miss the moment for defeating the enemy.
```

Spies

Maybe it is not so relevant whether Sun Tzu was capable of using, and indeed used, 2nd or higher orders of theory of mind. Instead of guessing what the enemy was planning, Sun Tzu wanted to know *for sure* what his enemy was planning, by employing *spies*. The last chapter of the Art of War, Ch. XIII has as title *The Use of Spies*. Sun Tzu explains at length the types of spies and how to employ them.

In modern times, spies are often portrayed as despicable persons and espionage is considered a crime by many nations. Sun Tzu on the other hand, considers that not using spies is inhumane. Here is a quote:

```
4. Thus, what enables the wise sovereign and the good
commander
  » to strike and conquer,
  » and achieve things beyond the reach of ordinary
    men,
  » is foreknowledge.

5. this foreknowledge
  » cannot be elicited from spirits;
  » it cannot be obtained inductively from experience,
  » nor by any deductive calculation.
  » 6. Knowledge of the enemy's dispositions can only
    be obtained from other men.

7. Hence the use of spies, ...
```

Chapter XIII of the Art of War, and therefore the whole book, ends with:

```
Spies are a most important element in warfare,
On them depends an army's ability to move.
```

Using spies is not exactly synonymous with employing theory of mind, but it has many similar elements.

Strategic Thinking

We will now look at specific places in the AoW where Sun Tzu speaks about *Strategic Thinking.* This also involves a step-up in our level of abstraction, since Sun Tzu does not describe any specific concrete strategic situations.

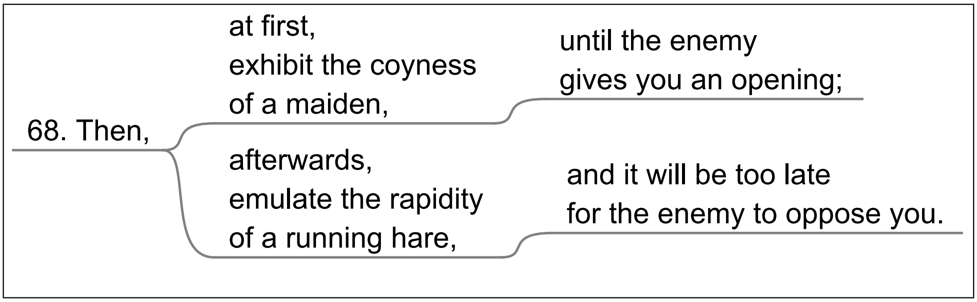
It may be noted that abstraction is one possible reason making it uncertain whether Sun Tzu was using or considering theory of mind, because to see theory of mind being used in practice, you need a concrete example, like the events at the Huarong pass.

Here is a definition:

> *Strategy* is a general plan to achieve one or more long-term or overall goals under conditions of uncertainty; while *Game Theory* could be defined as the study of mathematical models of *strategic interaction* among rational decision-makers.

Even if we are uncertain about the use and awareness of game theoretic principles by Sun Tzu in his work, we should be able to find out more about his strategic thinking, considering that the title in Chinese, of *the Art of War* is 兵法 or bīng fǎ. This approximately means *military strategy.*

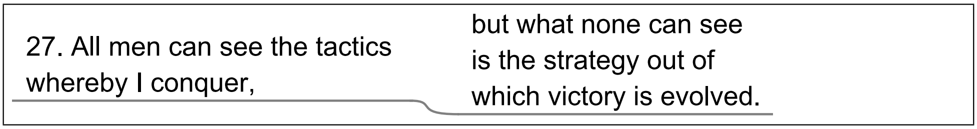
We start our reasoning in this section with a quote that symbolizes the way Sun Tzu is considering success in warfare, see figure 19.



68. Then,
at first,
exhibit the coyness
of a maiden,
until the enemy
gives you an opening;
afterwards,
emulate the rapidity
of a running hare,
and it will be too late
for the enemy to oppose you.

Fig. 19: Ch.XI-Par.68: Success in Warfare

Also interesting is figure 20, Strategic Thinking, where Sun Tzu makes a clear distinction between strategy and tactics.



27. All men can see the tactics
whereby I conquer,
but what none can see
is the strategy out of
which victory is evolved.

Fig. 20: Ch.VI-Par.27: Strategy

Sun Tzu uses the word *strategy* only once in the Giles[23] translation, in chapter VI, Weak Points and Strong, where he argues that only he himself knows what the strategy is he was using to win a war, while everybody can see his tactics, meaning the concrete steps, that led to victory, see figure 20.

The word *tactic* is used 16 times, but looking at the Chinese, this may or may not be correct, because the word used, 形 (xíng), actually means form or shape. Probably the word 法 (fǎ), which appears in the Chinese title of *the Art of War*, meaning *method* or *way*, is more appropriate as an indicator of methods used by Sun Tzu. The 法 (fǎ) character is found 21 times in the text and is a good indicator for finding abstract, strategic advice.

The question we posed in the preceding section is, what we can find in *the Art of War* to support the notion that Sun Tzu considered *theory of mind reasoning* or, more generally, whether he employed *strategic thinking.*

The following examples try to clarify that indeed there is enough reasoning about what the enemy is thinking and what the possible reactions to that are. Whether that should be interpreted as *theory of mind* is a matter of words or of definition.

The first example we saw already, when Sun Tzu is talking about *deception*, where he says in Ch.I-par.18 that all warfare is based on deception: pretend to be strong where you weak.

AoW Ch. I, par. 26

The second example could be an indication that Sun Tzu was considering the thinking of his enemy, see figure 21. It could also be advice about calculations of relative army size of your own army and that of the enemy. Or, it could be talking about how long it would take your army or the army of the enemy, to reach a favorable terrain.

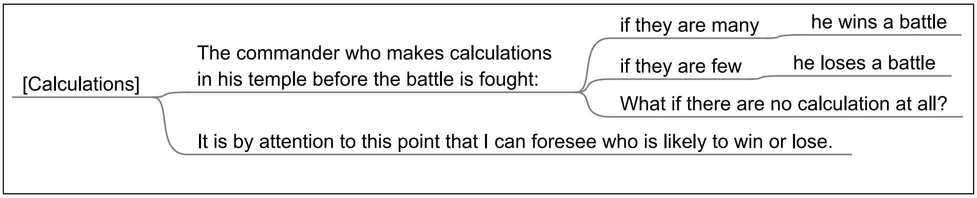

[Calculations]
The commander who makes calculations in his temple before the battle is fought:
if they are many
he wins a battle
if they are few
he loses a battle
What if there are no calculation at all?
It is by attention to this point that I can foresee who is likely to win or lose.

Fig. 21: Calculations

However, if with many calculations a commander should win, then we must take the thinking of his opponent into consideration, otherwise winning would be impossible.

AoW Ch. III, par. 3

In chapter III, par. 3, Sun Tzu writes:

```
3. Therefore, the highest form of commandership is to
   balk the enemy's plans;
```

which, according to Griffith [26] should mean: *What is of supreme importance in war, is to attack the enemy's strategy.* [12] This, again, assumes knowledge of, or assumtions about, the enemy's strategy.

---

[12] See figure 40 for the mind map fragment, in the second part of this book.

Aow Ch. III, par.18

At the end of chapter III there is the famous saying in par.18, see figure 22.

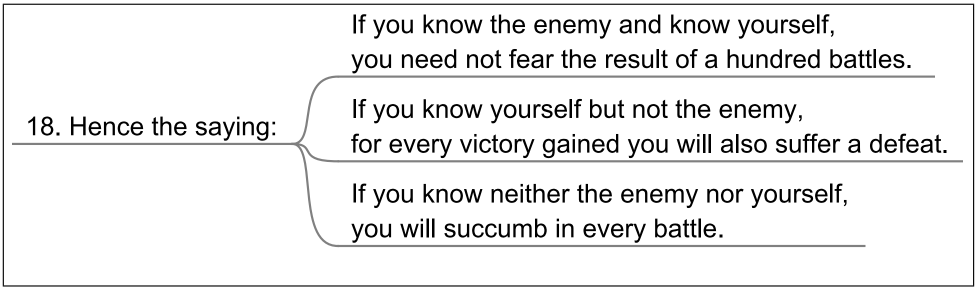

18. Hence the saying:
If you know the enemy and know yourself, you need not fear the result of a hundred battles.
If you know yourself but not the enemy, for every victory gained you will also suffer a defeat.
If you know neither the enemy nor yourself, you will succumb in every battle.

Fig. 22: Hence the saying:

Knowing the enemy probably involves familiarity with the thinking of this enemy, which again comes very close to employing theory of mind.

AoW Ch. IV, par. 18

Another good example of strategical thinking is in chapter IV, par. 18, (see also figure 23):

```
Earth determines:
  » (1) Analysis, determines:
    ° (2) Estimation of quantity,determines:
      - (3) Calculation,determines:
        - (4) Balancing of chances, determines:
         - (5), Victory.
```

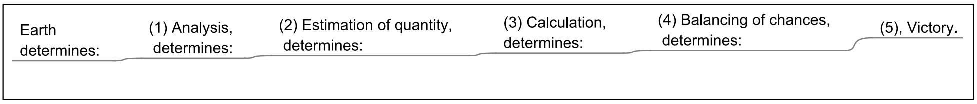

Earth determines:
(1) Analysis, determines:
(2) Estimation of quantity, determines:
(3) Calculation, determines:
(4) Balancing of chances, determines:
(5), Victory.

Fig. 23: Military Method

See for a description of the interesting syntactic structure that is used here: Military Method, on page 165.

It seems that Cao Cao in his approach to the Huarong pass, forgot to consider step 4: Balance your chances.

AoW Ch. V, par. 19

Here is an example of trying to trick the enemy into some action that will lead to his defeat.

In par. 19 in the same chapter V, Sun Tzu says:

```
19. Thus, one who is skillful at keeping the enemy on the
move
  » maintains deceitful appearances, according to which
    the enemy will act.
  » He sacrifices something, that the enemy may snatch
    at it.
  » 20. By holding out baits, he keeps him on the
    march;
    ° then with a body of picked men he lies in wait
      for him.
```

AoW Ch. VI, par. 9

Here is another example where deception and keeping secret what your plans are, are important to winning.

```
[Invisible and Inaudible]
  » 9. O divine art of subtlety and secrecy,
    ° through you we learn to be invisible
    ° through you we learn to be inaudible;
    ° and hence we can hold the enemy's fate in our
      hands.
```

AoW Ch. VII, par. 3

Here it is not obvious how Sun Tzu intends to turn any misfortune around.

In any case it will involve close observation of his enemy.

```
    ° The difficulty of tactical maneuvering consists
      - in turning the devious into the direct,
      - and misfortune into gain.
```

AoW Ch. VII, par. 15-22

In this example, the question arises how close employing deception is to the use of theory of mind. You cannot deceive an enemy if you have no idea what his perception of reality is.

```
 [Deception]
  » 15. War is based on deception
    ° move with opportunity
      - 16. divide and concentrate according to the
        variables
  » Therefore,
  ...
  » 21. Ponder and deliberate before you make a move.
  » 22. He will conquer who has learnt the artifice of
    deviation.
Such is the art of contending
```

AoW Ch. VIII

Chapter VIII has the title: Variation in Tactics, or more literally translated: Nine Variations. That already sounds like a treatise in strategy and tactics, which it indeed is. Here is a quote:

```
[Advantage and Disadvantage]
  » So
    ° 4. The commander who thoroughly understands the
      advantages that accompany variation of tactics
      - knows how to handle his troops.
    ° 5. The commander who does not understand these,
      - may be well acquainted with the configuration of
        the country,
      - yet he will not be able to turn his knowledge to
        practical account.
```

The preceding examples show an abstract approach to tactics in a war. Since the concept of *theory of mind* was not known in the way we understand this today, in the time of Sun Tzu, it is impossible to state that he in his reasoning was not capable to infer I-think-that-you-think-that-I-think…situations.

Some examples, like comparative calculations of the sizes of your army and that of the enemy, or when to avoid or occupy various types of terrain, may be just one-level inferences.

Deception is another aspect that Sun Tzu considers most important. Pretend that you are weak when you are strong and the other way around, are strong concepts which assume considering what the enemy thinks of your army and how you can influence this.

As a last example in our line-up of strategic calculations there is this quote from chapter VI:

AoW Ch. VI, par. 33

```
33. He who can modify his tactics in relation to his
opponent and thereby succeed in winning,
  » may be called a heaven-born captain.
```

This is one of the clearest statements where Sun Tzu describes tactics that are very close to our definition of *Theory of Mind*.

The Mind Mapping Perspective

Abstract This last chapter of Part one tries to identify some contributions that we hope this book has made to understanding Sun Tzu's *the Art of War*. We also try to identify what could be done with the data we collected, for future projects.

A celestial model by Zhang Heng (張衡, AD 78–139).

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P. van Emde Boas et al., *Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps*, Logic in Asia: Studia Logica Library,
https://doi.org/10.1007/978-981-19-6250-9_10

Mind Maps and Patterns

In the previous chapters of this book, we have argued that *mind maps*, or more precise, *text tree mind maps*, helped to clarify the meaning of the text and allowed us to find patterns, such as enumerations and pairs of opposites. Finding these patterns led to improvements in the mind maps and in the translations. In turn, these improvements led to finding new patterns, and so on. We feel that we have come now to the point of diminished returns, or, even with more effort, the results will be incremental.

We have gone from one dimensional text to two dimensional mind maps. Would it be possible to go to a third dimension? Although we do not have proper technical means to do this in an insightful way, we try to make some remarks in the next sections.

Looking at the Stars

> 自井中视星，所视不过数星；自丘上以视，则见其始出，又见其入。非明益也，势使然也.

If you looked at the stars from inside a well, no more than a few stars would be visible to you. If you look from a hilltop, then you can see when they first appear and when they fade away. It's not that they're any brighter, but the setting makes it this way. [1]

We take this quote as a metaphor for looking at ancient text such as *the Art of War*. In the previous chapters we recognized that making a two-dimensional view of linear text means that we will have a broader perspective of it, offering possibly new insight into the meaning of this text. [2]

It is this perspective that we only now start to grasp the significance of.

Patterns of Understanding

At first, we did mind mapping of *one* chapter of *the Art of War*, to get more understanding of its contents. In doing so, we found *patterns*, most notable *enumerations* and 故 (gù, therefore) related reasoning. While we found more patterns and mind mapped more chapters, we also amended the translation we used (more on that below) and adapted the mind maps accordingly.

So far we recognized a set of patterns that can be found *within a chapter*, spanning one or more sentences. Such as enumerations and metaphors. But what if we could find patterns that transcend the scope of just one chapter?

---

[1] This is a quote from the chapter Guangze (广泽) of the Shizi (尸子), Warring States period. Thomas Cleary made this quote in preface to the book of Thomas Huynh [33], the ultimate translation of *the Art of War*, as Huynh believes. Cleary is a well-known translator, of *the Art of War*, see [15] himself.

[2] A nice example of a more recent starry night, by van Gogh, is described here [105]. You can see two persons in the middle on a kind of island, who have a magnificent view of a starry night. Imagine what would happen if they sat in a well!

In chapter Sun Tzu and the Art of War, on page 11 we gave an overview of the contents of *the Art of War*. We indicated that the overview was based on the results of our mind mapping work, that provided us with a set of major topics for each chapter.

Let us show an overview mind map of the whole book, in figure 24:

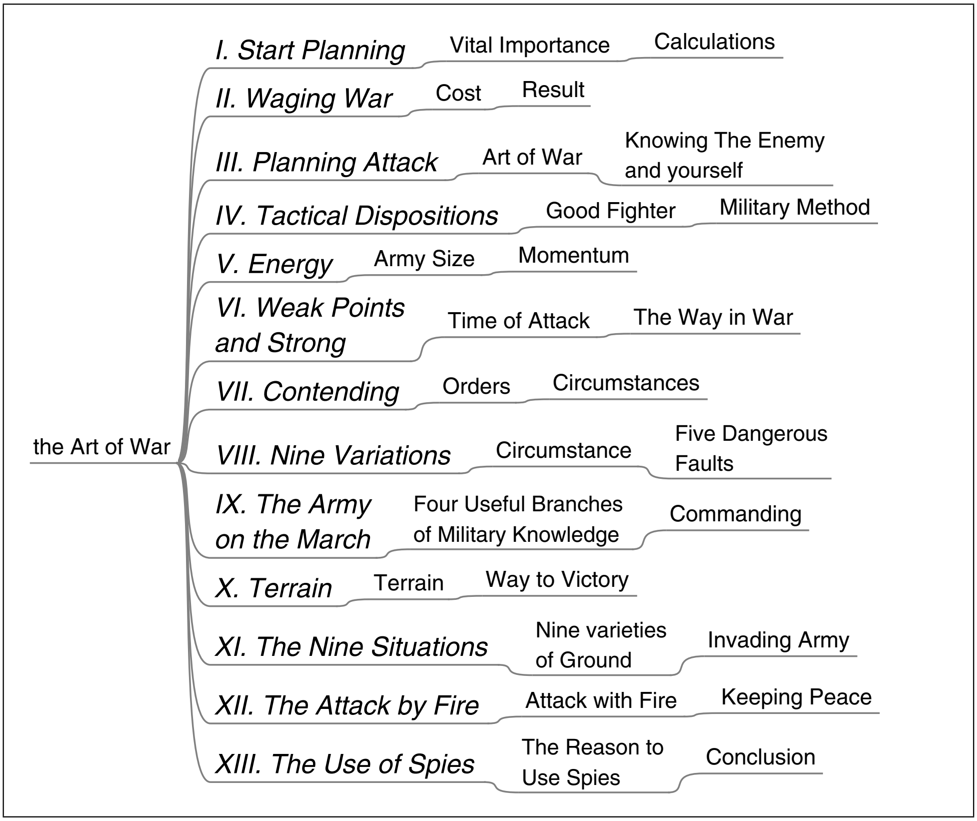
the Art of War
I. Start Planning
Vital Importance
Calculations
II. Waging War
Cost
Result
III. Planning Attack
Art of War
Knowing The Enemy and yourself
IV. Tactical Dispositions
Good Fighter
Military Method
V. Energy
Army Size
Momentum
VI. Weak Points and Strong
Time of Attack
The Way in War
VII. Contending
Orders
Circumstances
VIII. Nine Variations
Circumstance
Five Dangerous Faults
IX. The Army on the March
Four Useful Branches of Military Knowledge
Commanding
X. Terrain
Terrain
Way to Victory
XI. The Nine Situations
Nine varieties of Ground
Invading Army
XII. The Attack by Fire
Attack with Fire
Keeping Peace
XIII. The Use of Spies
The Reason to Use Spies
Conclusion

Fig. 24: the Art of War - Overview

We show here the first and the last subject that we found in for each AoW chapter. Remark that the subjects are not really written in the book, but were a result of the mind mapping and grouping of paragraphs. They just can be seen as section headings, that we found by grouping sentences in the mind map. An overview of these subjects is found at the beginning of the specific book chapter for that AoW chapter.

What can be seen is, that generally the first subject specifies the purpose of that chapter, and that the last one gives a result or conclusion. Interesting is also, that for many chapters, the last paragraph, or sometimes two, contain a famous saying. Here is the list:

- *I. Start Planning*: par 26: Thus do many calculations lead to victory, and few calculations to defeat.
- *II. Waging War*: par 16: In war, then, let your great object be victory, not lengthy campaigns.

- *III. Planning Attack*: par. 18: Hence the saying: If you know the enemy and know yourself, you need not fear the result of a hundred battles.
- *IV. Tactical Dispositions*: par. 20: The onrush of a conquering force is like the bursting of pent-up waters into a chasm a thousand fathoms deep.
- *V. Energy*: par. 23: Thus the energy developed by good fighting men is as the momentum of a round stone rolled down a mountain thousands of feet in height.
- *VI. Weak Positions and Strong*: par. 33: He who can modify his tactics in relation to his opponent and thereby succeed in winning, may be called a heaven-born captain.
- *VII. Contending*: par. 36: When you surround an army, leave an outlet free. Do not press a desperate foe too hard. [3]
- *VIII. Nine Variations*: par. 12: Five Dangerous Faults: Recklessness, cowardice, a hasty temper, a delicacy of honor which is sensitive to shame, over-solicitude for his men.
- *IX. The Army on the March*: par. 45: When a commander shows confidence in his men but always insists on his orders being obeyed, the gain will be mutual.
- *X. Terrain*: par. 31: Hence the saying: If you know the enemy and know yourself, your victory will not stand in doubt; if you know Heaven and know Earth, you may make your victory complete.
- *XI. The Nine Situations*: par. 68: At first, then, exhibit the reluctance of a maiden, until the enemy gives you an opening; afterwards emulate the rapidity of a running hare, and it will be too late for the enemy to oppose you.
- *XII. The Attack by Fire*: par. 21: But a kingdom that has once been destroyed, can never come again into being; nor can the dead ever be brought back to life.
- *XIII. The Use of Spies*: par. 28: Spies are a most important element in warfare, on them depends an army's ability to move.

Bad and Better Translations

In the introduction to the translation of the Art of War, on the site of the Gutenberg project, see `https://gutenberg.org/ebooks/132`, Bob Sutton writes:

> The first translation into English was published in 1905 in Tokyo by Capt. E. F. Calthrop, R.F.A. However, this translation is, in the words of Dr. Giles, “excessively bad.”
>
> ...
>
> Dr. Giles, in justifying his translation, wrote: “It was not undertaken out of any inflated estimate of my own powers; but I could not help feeling that Sun Tzu deserved a better fate than had befallen him, and I knew that, at any rate, I could hardly fail to improve on the work of my predecessors.”

As explained in the chapter about translations, where we describe the history of translating *the Art of War*, see Translations of The Art of War, on page 391, almost every translator thought that all previous translations were not good enough.

We do not claim that the translation we provide in this book is better than the one made by our predecessors. If only because our translation is still predominantly the Giles [24] translation from 1910. We amended the translation primarily on two points:

---

[3] Note that for AoW Ch. VII we only quoted the last one of the sayings. See figure Variation, on page 226 for the complete quote in mind map format.

1. Replace old-fashioned English that may be unknowns to most non-native English speakers. Such as in AoW Ch. III, par. 11: `Now, the general is the bulwark of the State`. A bulwark literally is a defensive wall, and probably this is not known by most people today. Therefore, we replaced bulwark by `Now, the commander is the guardian of the State`.
2. The second reason is the presentation of patterns. For example, in AoW Ch. I, par 19-24, Sun Tzu lists means of deceiving the enemy. While the Chinese text is of the form: …而 …之, the English translation used a mixture of if, when, then or no word at all. We uniformly replaced this with `when …then …`.

All other translations and even the Chinese versions, are bound by the linearity of the text. Our rendering of the text as mind maps and the acknowledgement of the patterns in the text, allows us to see more stars simultaneously.

Future Work

As we have referred to before, the second part of this book covers details about the shape of the mind maps we built, the patterns we found and remarks about the meaning of conditional sentences. The third part contains a list of *all* patterns we found with a reference to where they were found.

Having laid out all possible patterns and most conditional sentences that can be found in *the Art of War*, and we are convinced that we did a thorough job of it, the question arises what the next step, using this material, could be.

What we will do in this section, is pose some questions that fell out of our mind mapping work: [4]

- What is the true meaning of the character 凡 (fán) that occurs in the first paragraph in 9 chapters of *the Art of War*. There is no 凡 (fán) character in the first sentence of the chapters I, III, X and XI.
- Why are there no formal enumerations in chapter II and VII? What about informal enumerations?
- Could there be more light on, and meaning for, the controversy about pairs of opposites, contradictions, and paradoxes?
- More explanation and more study of Backtracking, reversed implications and the character 者 (zhě) could be made.
- Create a more refined classification of the conditional sentences, implications, and causal statements, based on typing antecedents and consequences, as events, situations, actions and judgements.
- Apply the mind mapping method to other old texts.
- Apply linguistic tools, like Voyant Tools [99], which we used to construct a word cloud of AoW Ch. V in Linguistic Text Analysis, on page 26, but which is capable of much more.
- In depth study of the book of Fu Chao about structure in the text of *the Art of War*.
- …

---

[4] In the introduction of his translation to *the Art of War* [46], Victor Mair provides many interesting facts about dating, authorship, military means, and especially meaning of the text. There is no way we can surpass or even approach the depth of his research.

The above is a rather random set of items that could be interesting for future work. We think that it is outside the scope of this book however. The remainder of this book covers the detail mind maps for each AoW chapter, and the patterns we found in these chapters. Furthermore we provide a complete list of the patterns, and miscellaneous chapters with remarks about terrain and translations.

Part II

Mind Maps

As we explained in the overview of this book, the use of mind maps adds a visual dimension to the text and can therefore provide a substantially new insight.

In this part we look at the mind maps we made in detail. As we described in section: The Mind Maps in Part 2 of this Book, on page 41, there is a chapter in this part for every chapter in Sun Tzu's *the Art of War*. To summarize, each chapter lists the main concepts, it has an overview of the contents, followed by a Chinese mind map, and an English mind map. Then, details for each main concept are described, showing a mind map fragment, and the patterns applicable to this part. Structured text, following the structure of the mind map, is placed at the end of each chapter,

I. START PLANNING - 始計

Abstract The first chapter in *The Art of War* covers making preparations. We find several of the more frequently used patterns by Sun Tzu, such as *enumerations, pairs of opposites* and *conditional sentences.*

Strategy of Combining Tactics

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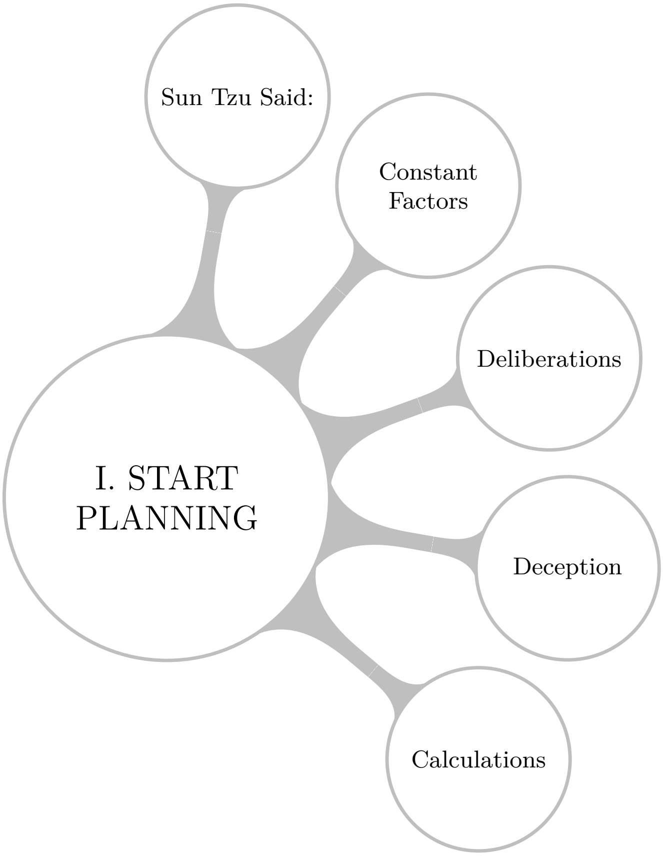
P. van Emde Boas et al., *Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps*, Logic in Asia: Studia Logica Library,
https://doi.org/10.1007/978-981-19-6250-9_11

Main Concepts

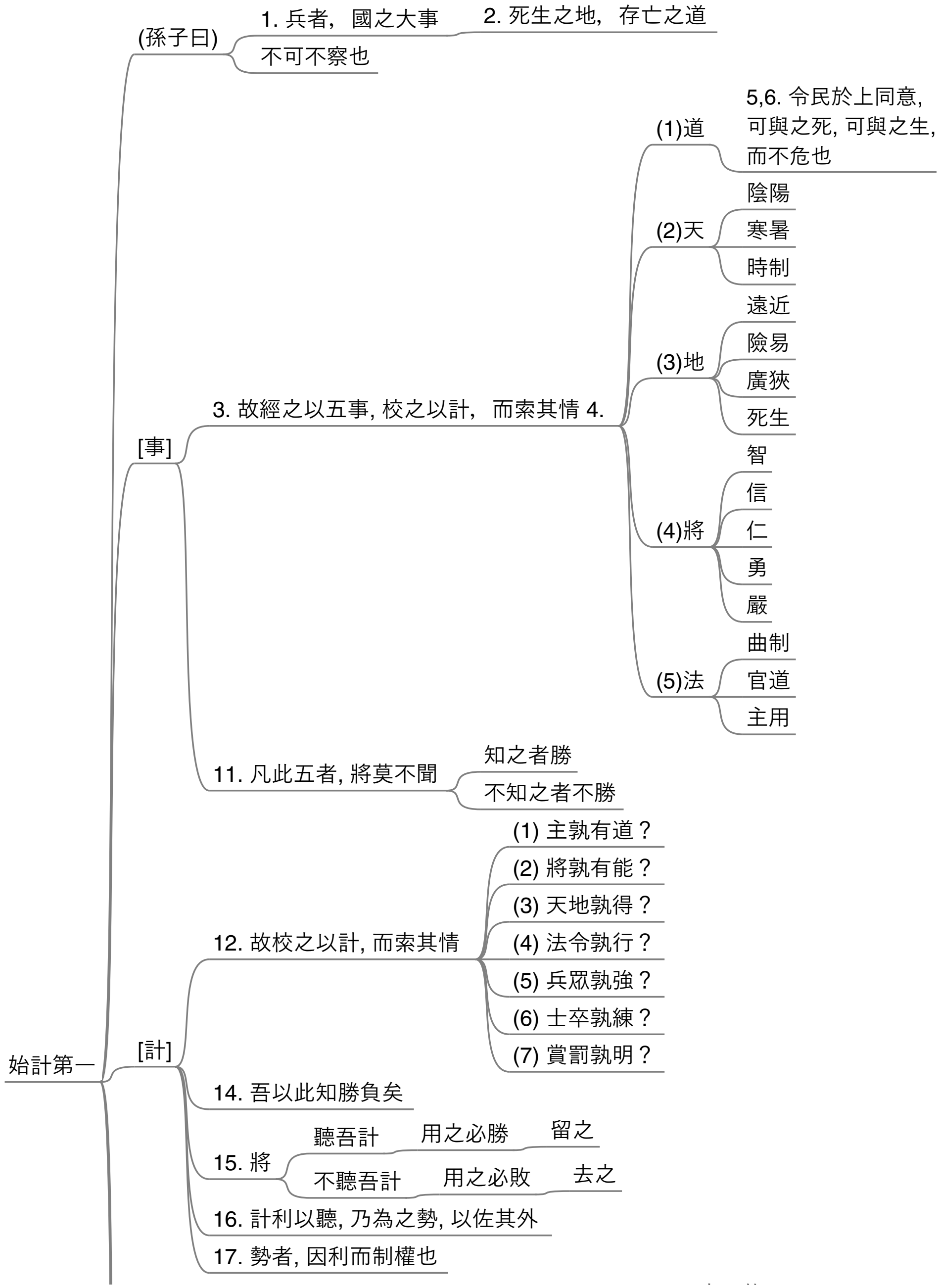

Sun Tzu Said:
Constant Factors
Deliberations
I. START PLANNING
Deception
Calculations

Overview of the Contents

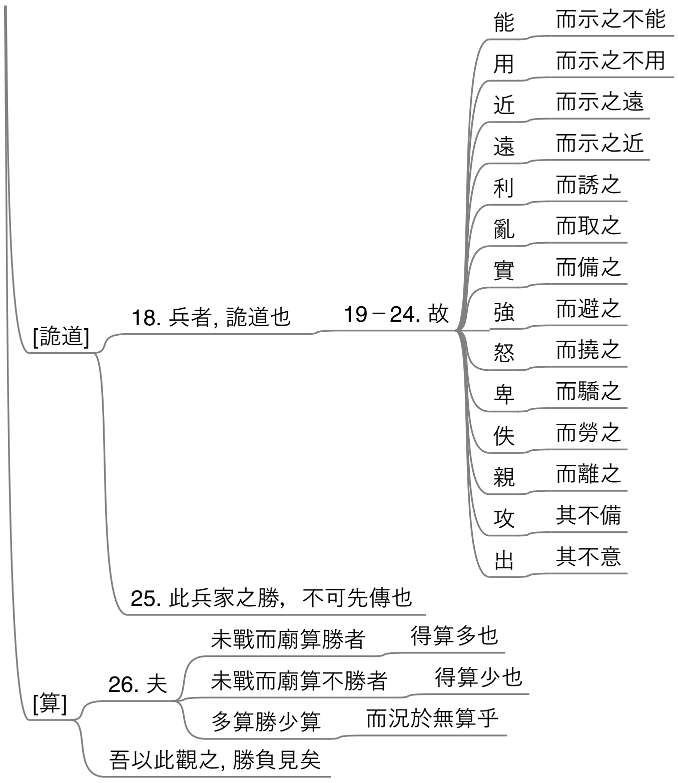
The first chapter in *The Art of War* talks about the importance of making preparations, taking several factors into account, such as morale, circumstances and organization. Sun Tzu advises to assess which side has advantage in all of these factors. He states: *Warfare is a way of deception*, and subsequently he points out what can be done in various circumstances to deceive the opponent.

The Mind Maps

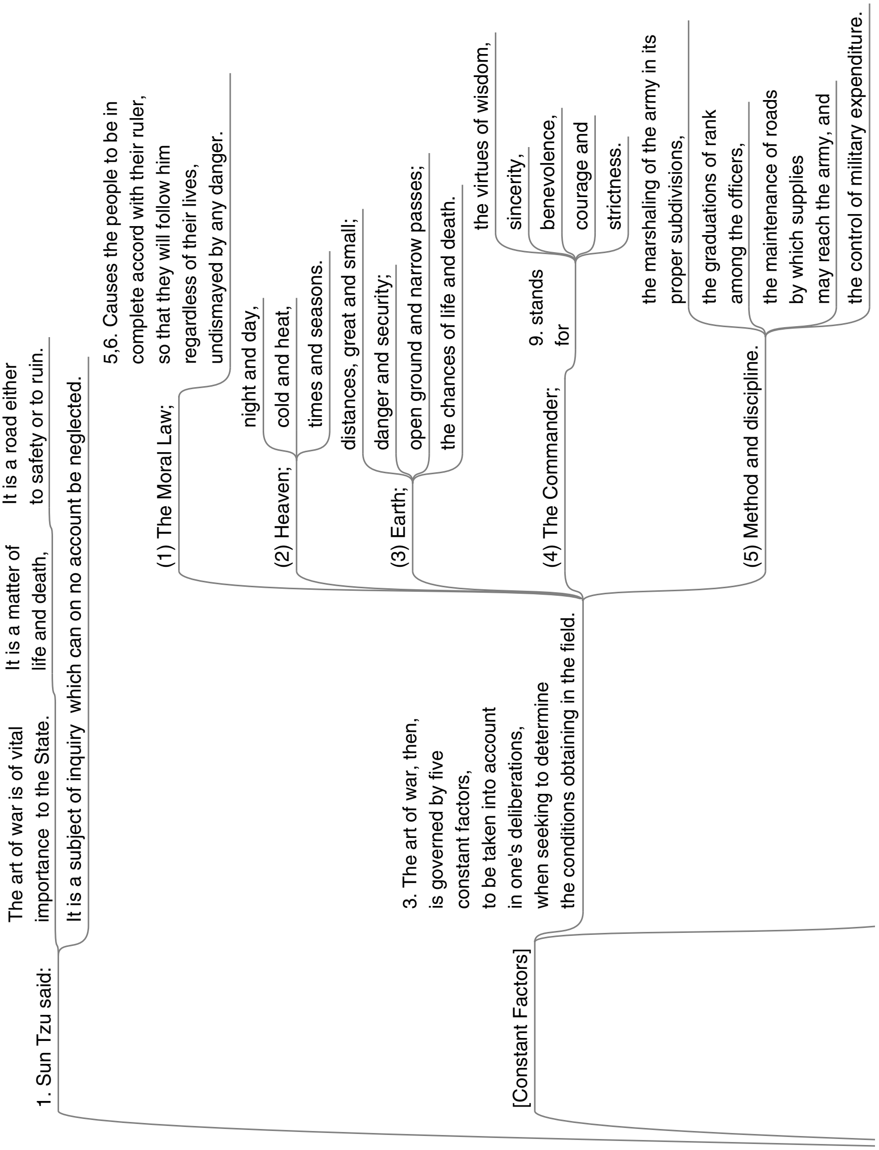
The overview for this chapter can be found in mind map figures 1 to 5.


始計第一
(孫子曰)
1. 兵者，國之大事
2. 死生之地，存亡之道
不可不察也
[事]
3. 故經之以五事, 校之以計，而索其情 4.
(1)道
5,6. 令民於上同意,
可與之死, 可與之生,
而不危也
(2)天
陰陽
寒暑
時制
(3)地
遠近
險易
廣狹
死生
(4)將
智
信
仁
勇
嚴
(5)法
曲制
官道
主用
11. 凡此五者, 將莫不聞
知之者勝
不知之者不勝
[計]
12. 故校之以計, 而索其情
(1) 主孰有道？
(2) 將孰有能？
(3) 天地孰得？
(4) 法令孰行？
(5) 兵眾孰強？
(6) 士卒孰練？
(7) 賞罰孰明？
14. 吾以此知勝負矣
15. 將
聽吾計
用之必勝
留之
不聽吾計
用之必敗
去之
16. 計利以聽, 乃為之勢, 以佐其外
17. 勢者, 因利而制權也

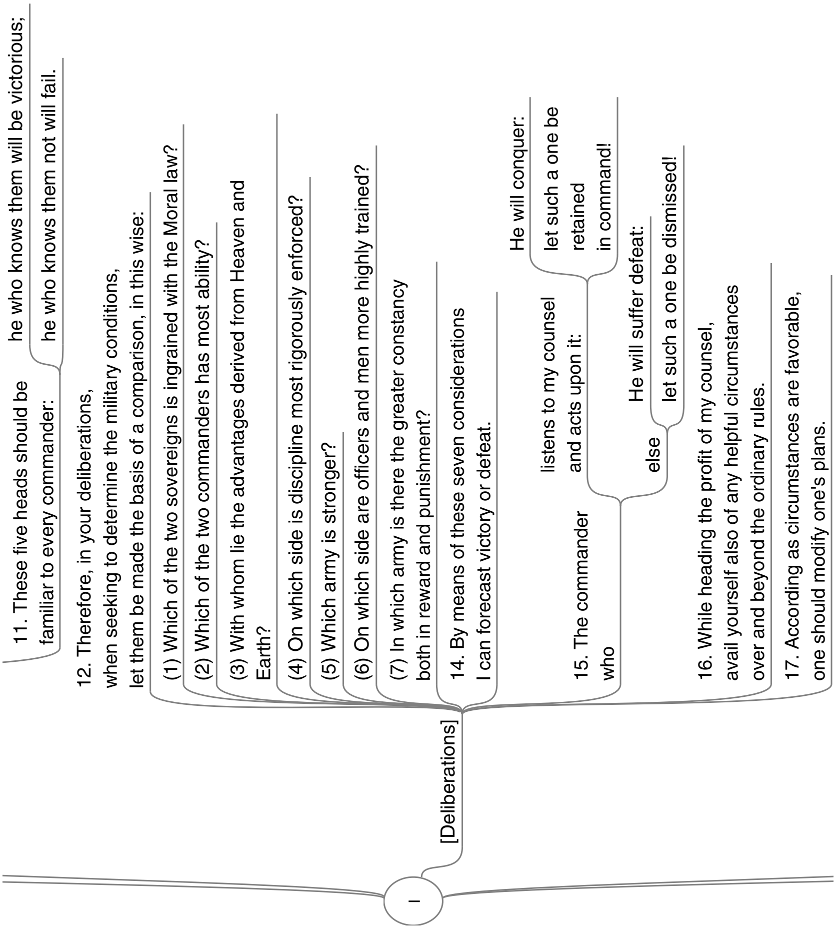
Mind Map 1: Aow Ch. I, Chinese Mind Map - Part 1


[詭道]
18. 兵者, 詭道也
19－24. 故
能
而示之不能
用
而示之不用
近
而示之遠
遠
而示之近
利
而誘之
亂
而取之
實
而備之
強
而避之
怒
而撓之
卑
而驕之
佚
而勞之
親
而離之
攻
其不備
出
其不意
25. 此兵家之勝, 不可先傳也
[算]
26. 夫
未戰而廟算勝者
得算多也
未戰而廟算不勝者
得算少也
多算勝少算
而況於無算乎
吾以此觀之, 勝負見矣

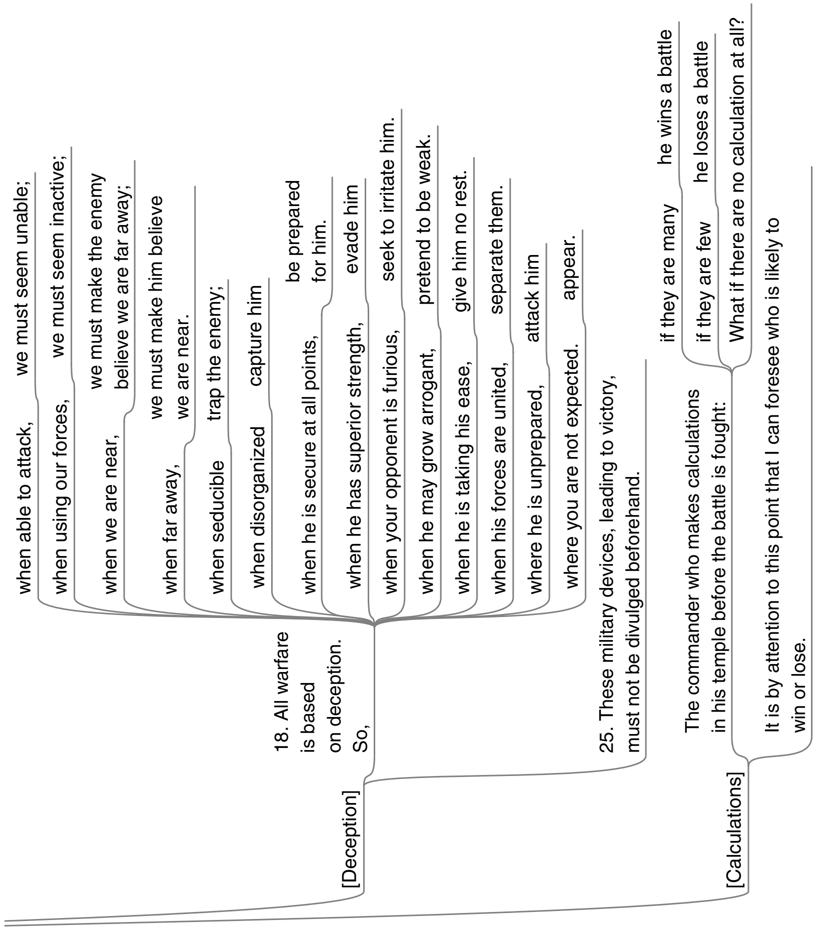
Mind Map 2: Aow Ch. I, Chinese Mind Map - Part 2


1. Sun Tzu said:
The art of war is of vital importance to the State.
It is a matter of life and death,
It is a road either to safety or to ruin.
It is a subject of inquiry which can on no account be neglected.
[Constant Factors]
3. The art of war, then, is governed by five constant factors, to be taken into account in one's deliberations, when seeking to determine the conditions obtaining in the field.
(1) The Moral Law;
5,6. Causes the people to be in complete accord with their ruler, so that they will follow him regardless of their lives, undismayed by any danger.
(2) Heaven;
night and day,
cold and heat,
times and seasons.
(3) Earth;
distances, great and small;
danger and security;
open ground and narrow passes;
the chances of life and death.
(4) The Commander;
9. stands for
the virtues of wisdom,
sincerity,
benevolence,
courage and
strictness.
(5) Method and discipline.
the marshaling of the army in its proper subdivisions,
the graduations of rank among the officers,
the maintenance of roads by which supplies may reach the army, and
the control of military expenditure.

Mind Map 3: Aow Ch. I, START PLANNING - English Mind Map - Part 1


–
[Deliberations]
11. These five heads should be familiar to every commander:
he who knows them will be victorious;
he who knows them not will fail.
12. Therefore, in your deliberations, when seeking to determine the military conditions, let them be made the basis of a comparison, in this wise:
(1) Which of the two sovereigns is ingrained with the Moral law?
(2) Which of the two commanders has most ability?
(3) With whom lie the advantages derived from Heaven and Earth?
(4) On which side is discipline most rigorously enforced?
(5) Which army is stronger?
(6) On which side are officers and men more highly trained?
(7) In which army is there the greater constancy both in reward and punishment?
14. By means of these seven considerations I can forecast victory or defeat.
15. The commander who
listens to my counsel and acts upon it:
He will conquer:
let such a one be retained in command!
else
He will suffer defeat:
let such a one be dismissed!
16. While heading the profit of my counsel, avail yourself also of any helpful circumstances over and beyond the ordinary rules.
17. According as circumstances are favorable, one should modify one's plans.

Mind Map 4: Aow Ch. I, START PLANNING - English Mind Map - Part 2


[Deception]
18. All warfare is based on deception. So,
when able to attack,
we must seem unable;
when using our forces,
we must seem inactive;
when we are near,
we must make the enemy believe we are far away;
when far away,
we must make him believe we are near.
when seducible
trap the enemy;
when disorganized
capture him
when he is secure at all points,
be prepared for him.
when he has superior strength,
evade him
when your opponent is furious,
seek to irritate him.
when he may grow arrogant,
pretend to be weak.
when he is taking his ease,
give him no rest.
when his forces are united,
separate them.
where he is unprepared,
attack him
where you are not expected.
appear.
25. These military devices, leading to victory, must not be divulged beforehand.
[Calculations]
The commander who makes calculations in his temple before the battle is fought:
if they are many
he wins a battle
if they are few
he loses a battle
What if there are no calculation at all?
It is by attention to this point that I can foresee who is likely to win or lose.

Mind Map 5: Aow Ch. I, START PLANNING - English Mind Map - Part 3

Details and Patterns

Where applicable, you can find the formalized conditional sentences listed for each section.

Sun Tzu Said:

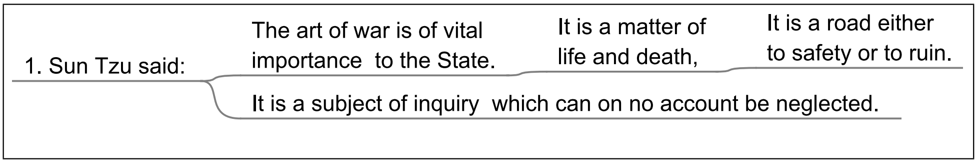

1. Sun Tzu said:
The art of war is of vital importance to the State.
It is a matter of life and death,
It is a road either to safety or to ruin.
It is a subject of inquiry which can on no account be neglected.

Fig. 25: Sun Tzu Said

Each chapter in *The Art of War* starts with: *Sun Tzu Said:*. Some chapters have a general statement or advice about that chapter. For chapter one this is a general statement about the whole book: *The art of war is of vital importance to the State.*

In our mind map we deviate slightly from the Giles translation on which it is based: We took out the *Hence* in the text of the last part: `It is a subject of inquiry which can on no account be neglected`, instead of: `Hence …`.

We did this, because paragraph 2 ends with 也 (yě, also, too). In classical Chinese it is used as affirmation, and not necessarily a conclusion, as *hence* would imply.

- **Conditional Sentences**
  - Par. 2: `Judge. => Judge.` .

Constant Factors

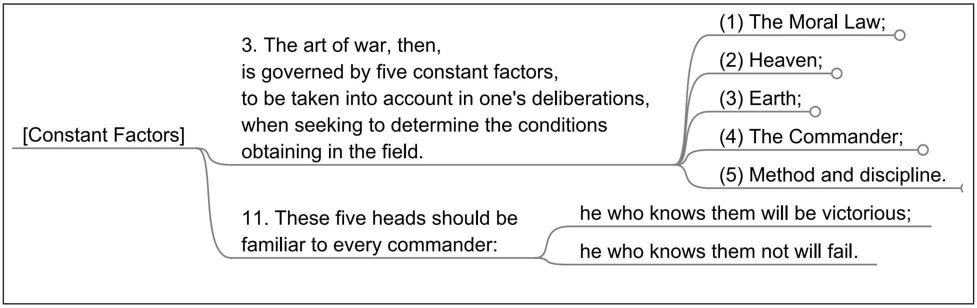

[Constant Factors]
3. The art of war, then, is governed by five constant factors, to be taken into account in one's deliberations, when seeking to determine the conditions obtaining in the field.
(1) The Moral Law;
(2) Heaven;
(3) Earth;
(4) The Commander;
(5) Method and discipline.
11. These five heads should be familiar to every commander:
he who knows them will be victorious;
he who knows them not will fail.

Fig. 26: Constant Factors - Overview

The *Constant Factors* are shown in the mind map fragments in figure 26, and figure 27. Sun Tzu states the importance of constant factors:

> 3. The art of war, then, is governed by five constant factors, to be taken into account in one's deliberations, when seeking to determine the conditions obtaining in the field.

These constant factors are things which Sun Tzu considers to be always true. An *enumeration pattern* is used to sum them up. In the next paragraphs he explains what each factor means.

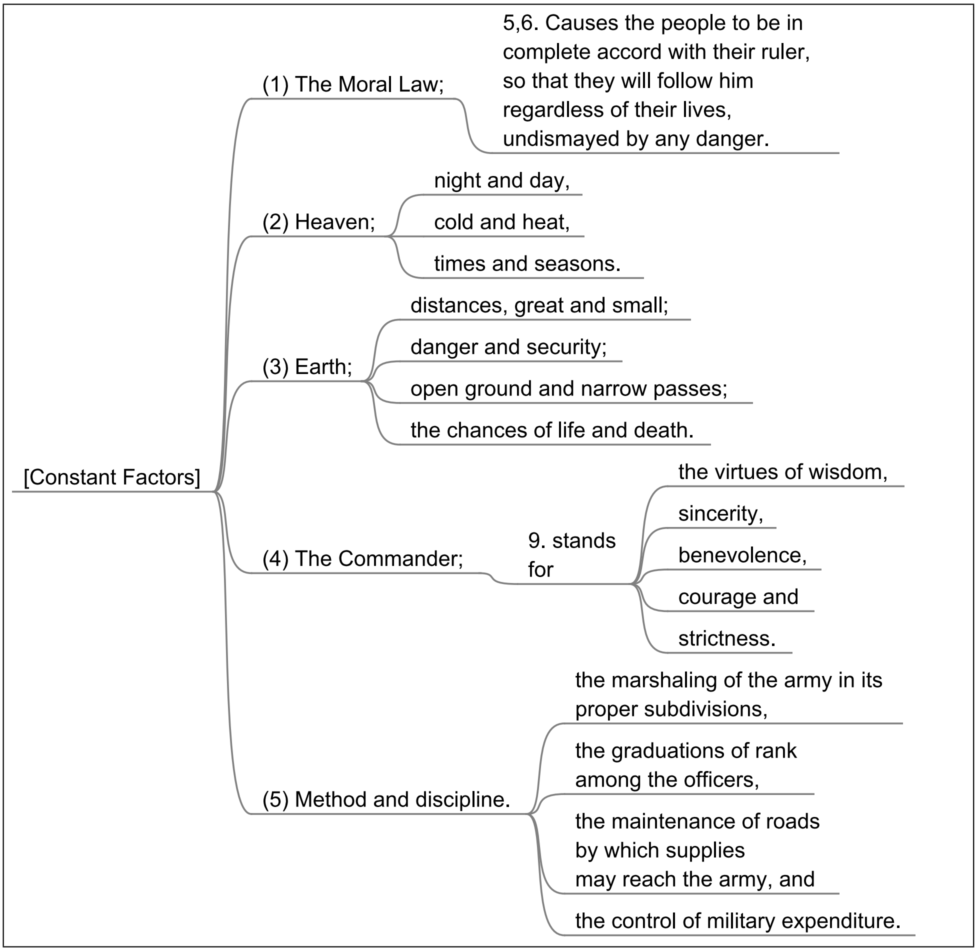

[Constant Factors]
(1) The Moral Law;
5,6. Causes the people to be in complete accord with their ruler, so that they will follow him regardless of their lives, undismayed by any danger.
(2) Heaven;
night and day,
cold and heat,
times and seasons.
(3) Earth;
distances, great and small;
danger and security;
open ground and narrow passes;
the chances of life and death.
(4) The Commander;
9. stands for
the virtues of wisdom,
sincerity,
benevolence,
courage and
strictness.
(5) Method and discipline.
the marshaling of the army in its proper subdivisions,
the graduations of rank among the officers,
the maintenance of roads by which supplies may reach the army, and
the control of military expenditure.

Fig. 27: Constant Factors - Details

Each of these constant factors follow a pattern too: each is a metaphor for the pairs or enumerations it describes.

- **Metaphors**
  - *Heaven* is a *metaphor* for these *pairs of opposites*: night and day, cold and heat, times and seasons.

  - *Earth* is a *metaphor* for a set of *pairs of opposites*: distances, great and small; danger and security; open ground and narrow passes; the chances of life and death.
  - *The Commander* is described by an informal *enumeration*: the virtues of wisdom, sincerity, benevolence, courage and strictness.
  - Method and discipline is an informal *enumeration*:
- **Conditional Sentences**
  - Par. 3: `=> 3 Judge. (故)` .

    Use of 故 as an elaboration rather than a Consequence,
  - Par. 11: `2(Cond. => Conseq.)` ,

    showing an if-then-else construct. We could have detailed the mind map more by splitting the condition and the consequence in the two lines of par. 11. Because the sentences are very short, we chose not to.
- **Definitions**
  - Par. 5-10: `5 Def.`

Deliberations

The *seven deliberations* clearly refer back to the constant factors, although there are only five constant factors and seven deliberations.

- Deliberation 1: moral law, refers to Constant Factor 1, the moral law.
- Deliberation 2: commander ability, refers to Constant Factor 4, the commander.
- Deliberation 3: heaven and earth, refers to Constant Factors 2 and 3, heaven and earth.
- Deliberations 4: discipline, 5: army strength, 6: army ability, and 7: constancy, refer to Constant Factor 5, Method and Discipline.

- **Conditional Sentences**
  - Par. 12: `=> Adv. (故)`
  - Par. 13-14: `=> Conseq.`
  - Par. 15: `(2 (Cond. => Adv.)`
  - Par. 16-17: `2Adv.`

Deception

All warfare is based on deception: this is a most important rule for Sun Tzu. He gives a few points to illustrate this, see figure 30.

In the section Creating a Mind Map from Text, on page 33, we used an example from chapter I, involving the Deception topic. We showed how regrouping, comparing with the Chinese text, and making changes to the translation, led to a uniform list of deceptions which a good commander should consider. Each deception is stated as a pair of opposites, which read as a prescription of what to do in various circumstances.

In the literature there is a controversy about what sentences like: *when able to attack, we must seem unable*, or *when we are near, we must make the enemy believe we are far away*,

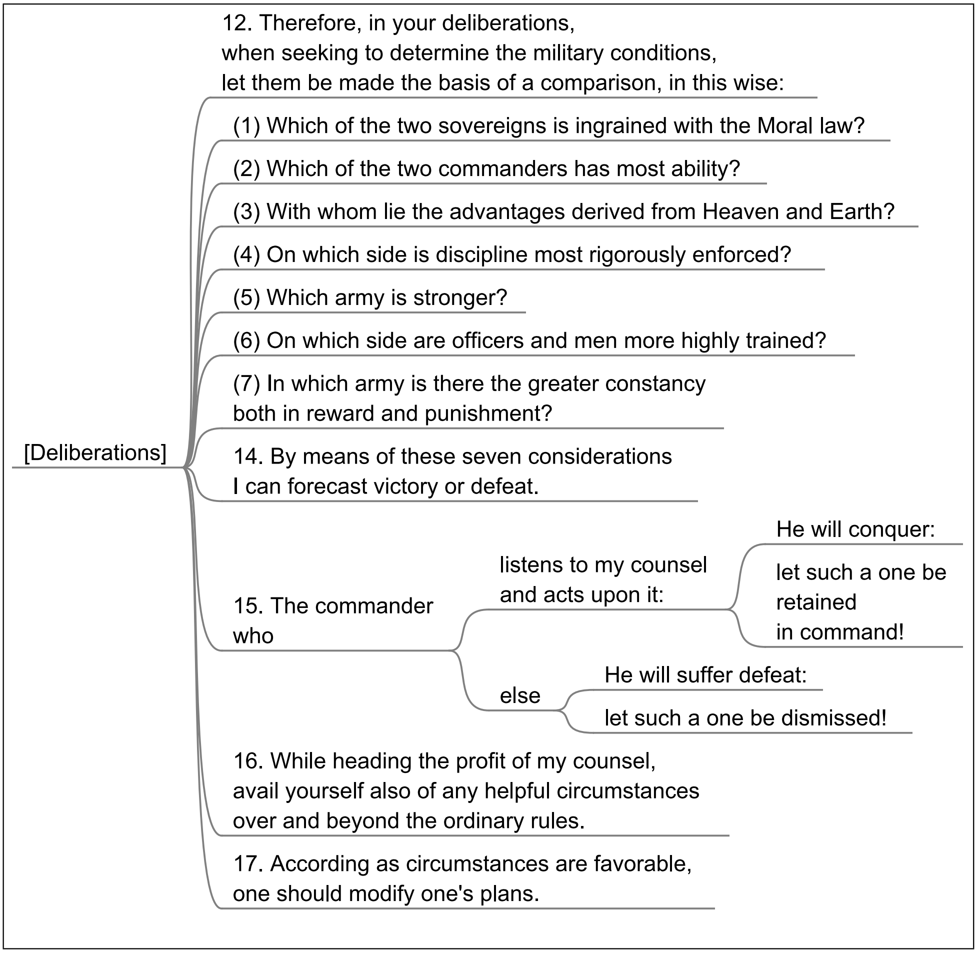

12. Therefore, in your deliberations,
when seeking to determine the military conditions,
let them be made the basis of a comparison, in this wise:
(1) Which of the two sovereigns is ingrained with the Moral law?
(2) Which of the two commanders has most ability?
(3) With whom lie the advantages derived from Heaven and Earth?
(4) On which side is discipline most rigorously enforced?
(5) Which army is stronger?
(6) On which side are officers and men more highly trained?
(7) In which army is there the greater constancy
both in reward and punishment?
[Deliberations]
14. By means of these seven considerations
I can forecast victory or defeat.
He will conquer:
listens to my counsel
and acts upon it:
let such a one be
retained
in command!
15. The commander
who
He will suffer defeat:
else
let such a one be dismissed!
16. While heading the profit of my counsel,
avail yourself also of any helpful circumstances
over and beyond the ordinary rules.
17. According as circumstances are favorable,
one should modify one's plans.

Fig. 28: Deliberations

may mean. To some, these pairs of opposites seem paradoxical or even contradictory. Therefore, we discuss in chapter: Logic, on page 43, some problems encountered while interpreting these deceptions, and we give references to other opinions about what Sun Tzu could have meant.

- **Conditional Sentences**
  - Par. 18: **Use of 也**. This is *not* a conditional sentence.
  - Par. 19-24: `(故), 14 (Cond. => Adv.)`

Calculations

At the end of AoW chapter 1, Sun Tzu gives his reasons for success in war, which basically amounts to do planning right.

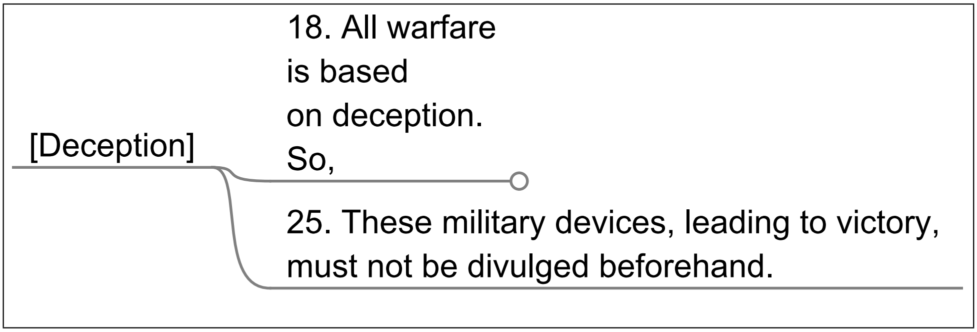

[Deception]
18. All warfare is based on deception. So,
25. These military devices, leading to victory, must not be divulged beforehand.

Fig. 29: Deception - Overview

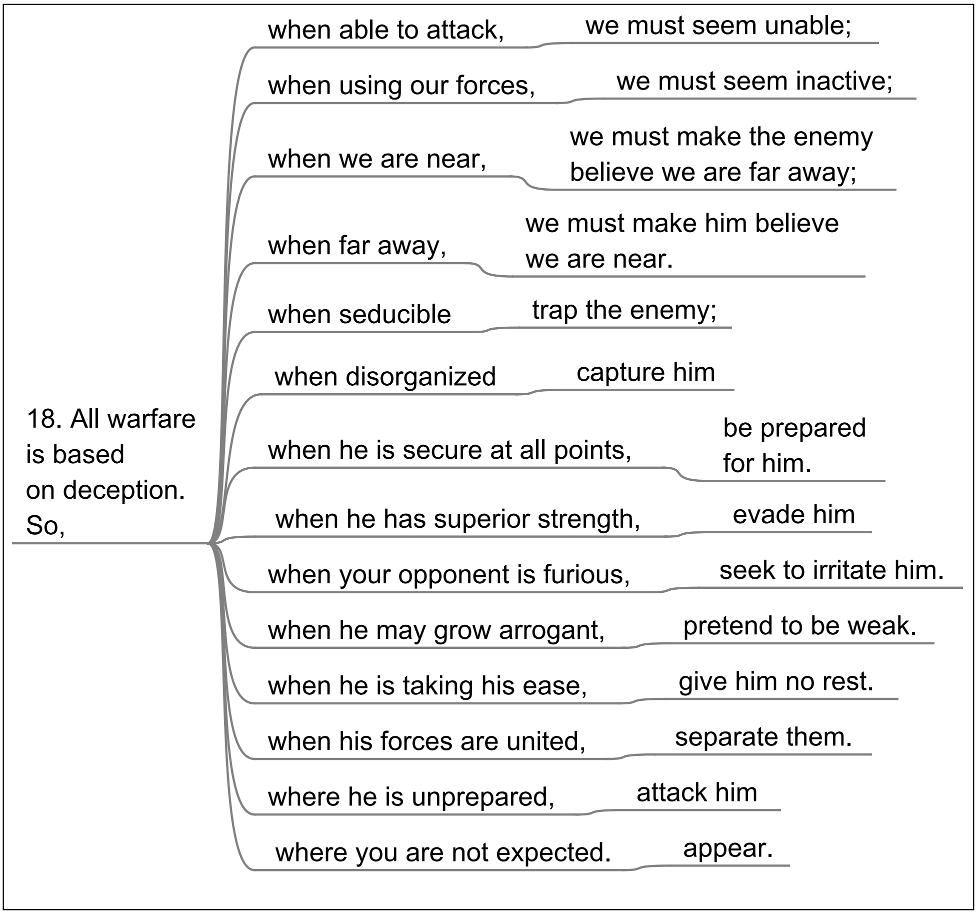

18. All warfare is based on deception. So,
when able to attack, we must seem unable;
when using our forces, we must seem inactive;
when we are near, we must make the enemy believe we are far away;
when far away, we must make him believe we are near.
when seducible trap the enemy;
when disorganized capture him
when he is secure at all points, be prepared for him.
when he has superior strength, evade him
when your opponent is furious, seek to irritate him.
when he may grow arrogant, pretend to be weak.
when he is taking his ease, give him no rest.
when his forces are united, separate them.
where he is unprepared, attack him
where you are not expected. appear.

Fig. 30: Deception - Details

This detail of the mind map shows an example of a *Conditional Sentence*. Sun Tzu discusses two conditions of a commander here:

- (1) the commanders that follow your command,
- (2) the commanders that do not follow your command.

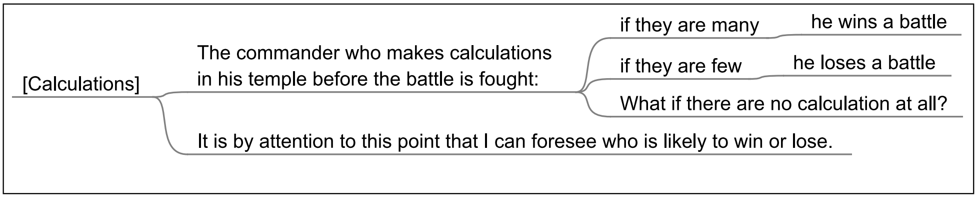

[Calculations]
The commander who makes calculations in his temple before the battle is fought:
if they are many
he wins a battle
if they are few
he loses a battle
What if there are no calculation at all?
It is by attention to this point that I can foresee who is likely to win or lose.

Fig. 31: Calculations

For condition (1), you keep this commander, and for condition (2) you dismiss him. Sun Tzu also gives reasons for why you should react differently to these two groups of commanders: The first group will conquer, and the second group will suffer defeat.

This is a very neat rule of thumb for evaluating your commanders, using a clear-cut separation.

As we see in the section about the preference order pattern, see: Preference Order, on page 56, Sun Tzu structures the text in such a way that he mentions the most desirable option first, a less desirable option next, and a condition that should not happen at all, last.

- **Conditional Sentence**
  - Par. 26: `3(Cond. => Conseq.); Judge.`

Structured Text

I. START PLANNING

- **1. Sun Tzu Said:**

```
The art of war is of vital importance  to the State.
  » It is a matter of life and death,
    ° It is a road either to safety or to ruin.
It is a subject of inquiry  which can on no account be
neglected.
```

- **Constant Factors**

```
3. The art of war, then, is governed by five constant
factors, to be taken into account in one's
deliberations, when seeking to determine the conditions
obtaining in the field.
  » (1) The Moral Law;
    ° 5,6. Causes the people to be in complete accord
      with their ruler,  so that they will follow him
      regardless of their lives,  undismayed by any danger.
  » (2) Heaven;
    ° night and day,
    ° cold and heat,
    ° times and seasons.
  » (3) Earth;
    ° distances, great and small;
    ° danger and security;
    ° open ground and narrow passes;
    ° the chances of life and death.
  » (4) The Commander;
    ° 9. stands for
      - the virtues of wisdom,
      - sincerity,
      - benevolence,
      - courage and
      - strictness.
  » (5) Method and discipline.
    ° the marshaling of the army in its proper
      subdivisions,
    ° the graduations of rank among the officers,
    ° the maintenance of roads by which supplies may
      reach the army, and
    ° the control of military expenditure.
11. These five heads should be familiar to every
commander:
  » he who knows them will be victorious;
  » he who knows them not will fail.
```

- **Deliberations**

```
12. Therefore, in your deliberations,  when seeking to
determine the military conditions,  let them be made the
basis of a comparison, in this wise:
  » (1) Which of the two sovereigns is ingrained with
```

the Moral law?
» (2) Which of the two commanders has most ability?
» (3) With whom lie the advantages derived from Heaven and Earth?
» (4) On which side is discipline most rigorously enforced?
» (5) Which army is stronger?
» (6) On which side are officers and men more highly trained?
» (7) In which army is there the greater constancy both in reward and punishment?

14. By means of these seven considerations I can forecast victory or defeat.

15. The commander who
» listens to my counsel and acts upon it:
° He will conquer:
- let such a one be retained in command!

» else
° He will suffer defeat:
- let such a one be dismissed!

16. While heading the profit of my counsel, avail yourself also of any helpful circumstances over and beyond the ordinary rules.

17. According as circumstances are favorable, one should modify one's plans.

- **Deception**

18. All warfare is based on deception. So,
» when able to attack,
° we must seem unable;
» when using our forces,
° we must seem inactive;
» when we are near,
° we must make the enemy believe we are far away;
» when far away,
° we must make him believe we are near.
» when seducible
° trap the enemy;
» when disorganized
° capture him
» when he is secure at all points,
° be prepared for him.
» when he has superior strength,
° evade him
» when your opponent is furious,
° seek to irritate him.
» when he may grow arrogant,
° pretend to be weak.
» when he is taking his ease,
° give him no rest.
» when his forces are united,
° separate them.
» where he is unprepared,
° attack him

```
  » where you are not expected.
    ° appear.
25. These military devices, leading to victory, must not
be divulged beforehand.
```

- **Calculations**

```
The commander who makes calculations in his temple
before the battle is fought:
  » if they are many
    ° he wins a battle
  » if they are few
    ° he loses a battle
  » What if there are no calculation at all?
It is by attention to this point that I can foresee who
is likely to win or lose.
```

II. WAGING WAR - 作戰

Abstract This chapter describes what is needed to prepare for war. There is not a large variety of patterns in this chapter: we mainly see a list of conditional sentences.

Xu Shu recommending Zhuge Liang on horseback.

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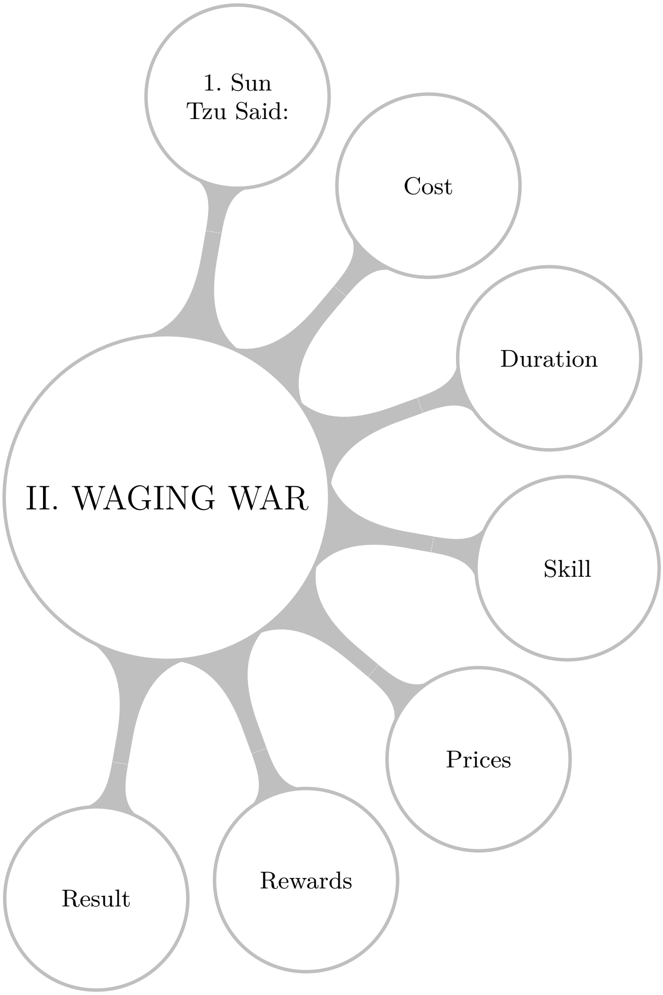
P. van Emde Boas et al., *Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps*, Logic in Asia: Studia Logica Library,
https://doi.org/10.1007/978-981-19-6250-9_12

Main Concepts

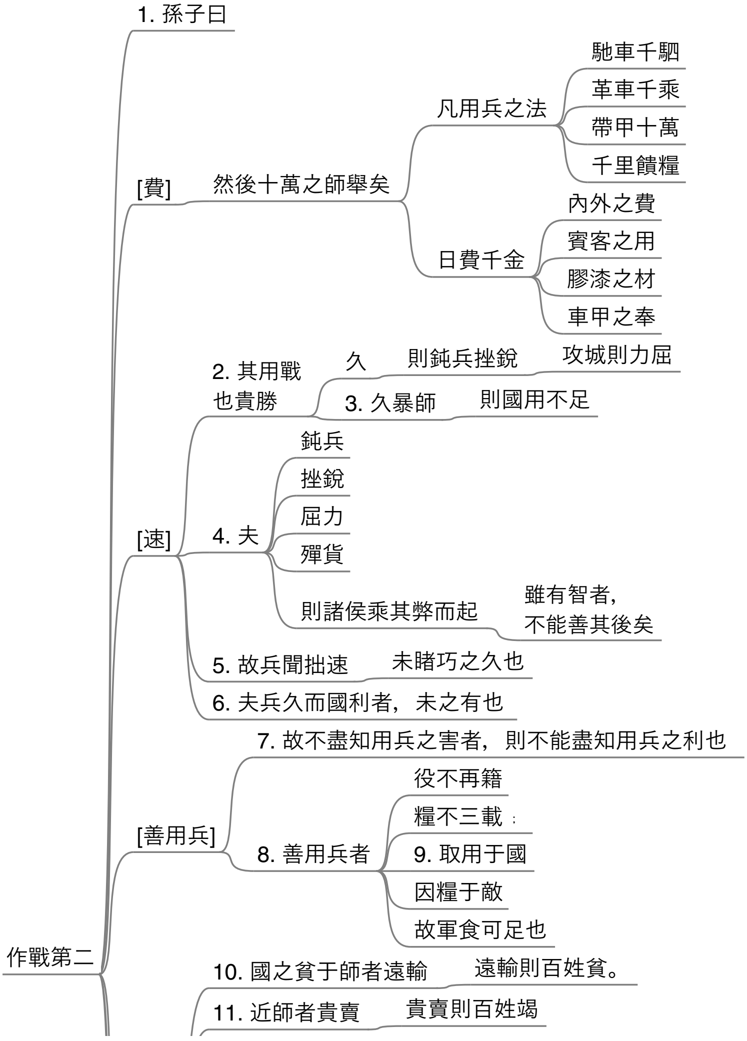

1. Sun Tzu Said:
Cost
Duration
II. WAGING WAR
Skill
Prices
Result
Rewards

Overview of the Contents

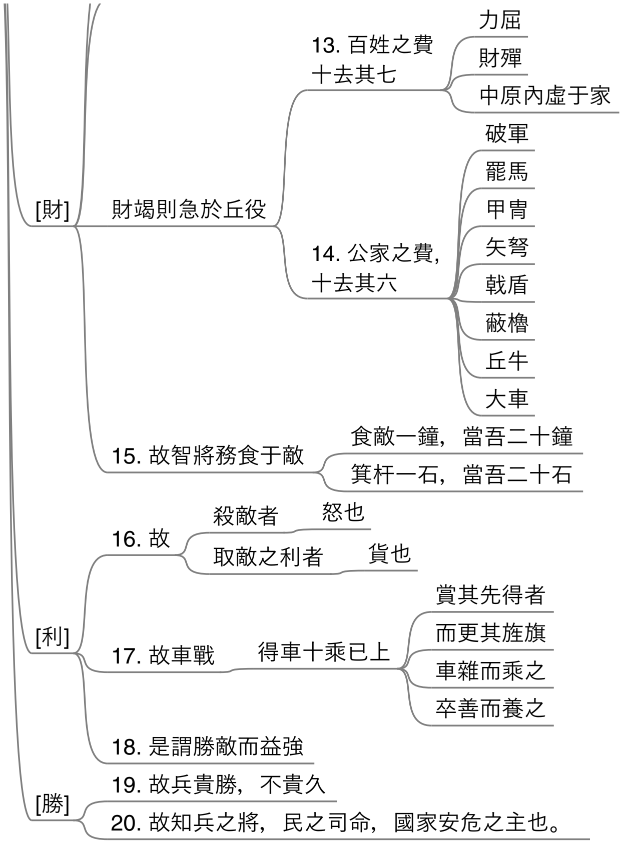
This chapter is not about war itself, but about what is needed in preparation. Although there is an explicit list of how many chariots and troops are needed at the start of the chapter, it continues with a list of rules of when to attack and how. Emphasis is put on avoiding a long war, which according to Sun Tzu can never be beneficial. He stresses that material and food should be taken from the enemy, and not sent from home.

The Mind Maps

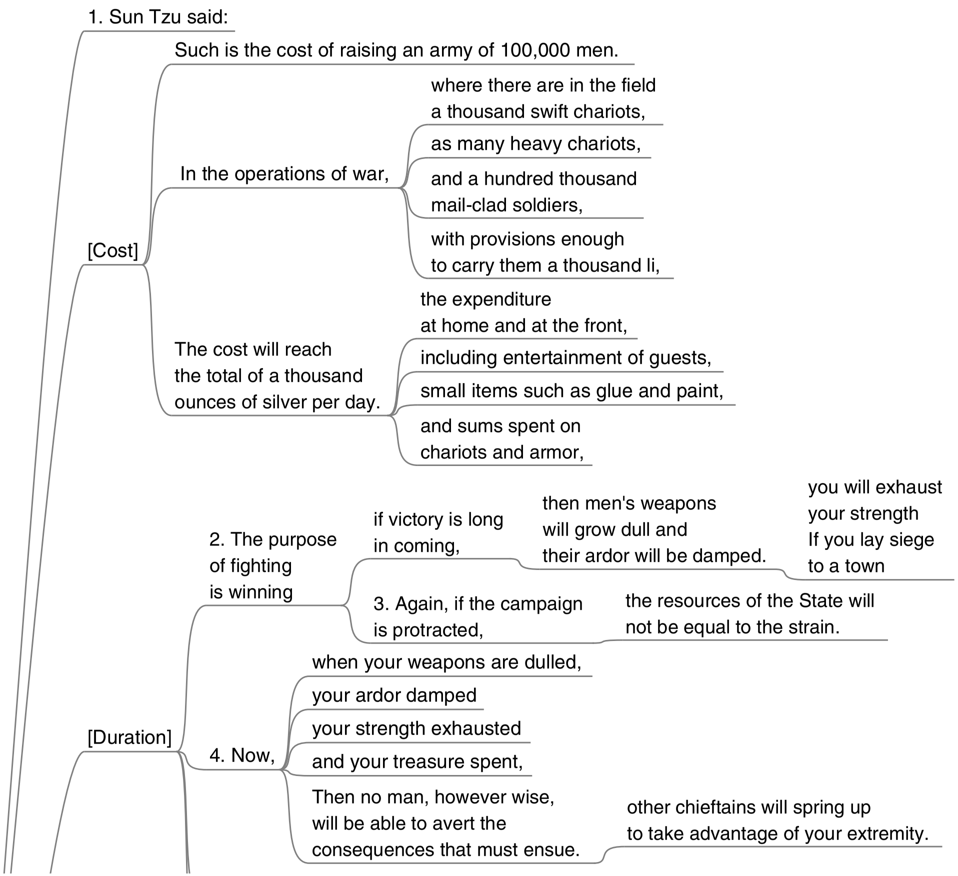
The overview for this chapter can be found in mind map figures 6 to 10.


作戰第二
1. 孫子曰
[費]
然後十萬之師舉矣
凡用兵之法
馳車千駟
革車千乘
帶甲十萬
千里饋糧
日費千金
內外之費
賓客之用
膠漆之材
車甲之奉
[速]
2. 其用戰也貴勝
久
則鈍兵挫銳
攻城則力屈
3. 久暴師
則國用不足
4. 夫
鈍兵
挫銳
屈力
殫貨
則諸侯乘其弊而起
雖有智者，不能善其後矣
5. 故兵聞拙速
未睹巧之久也
6. 夫兵久而國利者，未之有也
[善用兵]
7. 故不盡知用兵之害者，則不能盡知用兵之利也
8. 善用兵者
役不再籍
糧不三載
9. 取用于國
因糧于敵
故軍食可足也
10. 國之貧于師者遠輸
遠輸則百姓貧。
11. 近師者貴賣
貴賣則百姓竭

Mind Map 6: Aow Ch. II - Chinese Mind Map - Part 1

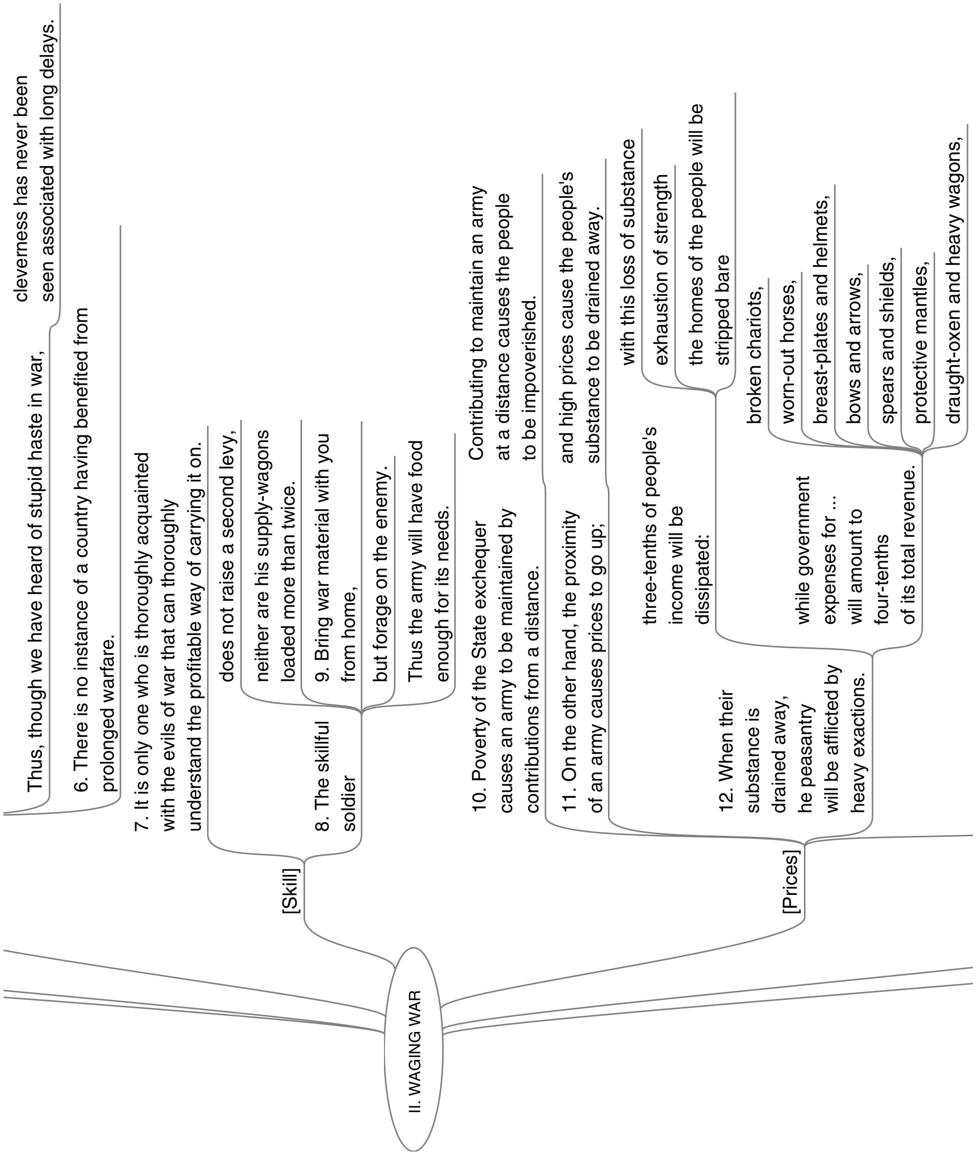

[財]
財竭則急於丘役
13. 百姓之費
十去其七
力屈
財殫
中原內虛于家
14. 公家之費，
十去其六
破軍
罷馬
甲冑
矢弩
戟盾
蔽櫓
丘牛
大車
15. 故智將務食于敵
食敵一鐘，當吾二十鐘
萁杆一石，當吾二十石
[利]
16. 故
殺敵者
怒也
取敵之利者
貨也
17. 故車戰
得車十乘已上
賞其先得者
而更其旌旗
車雜而乘之
卒善而養之
18. 是謂勝敵而益強
[勝]
19. 故兵貴勝，不貴久
20. 故知兵之將，民之司命，國家安危之主也。

Mind Map 7: Aow Ch. II - Chinese Mind Map - Part 2



- 1. Sun Tzu said:
- [Cost]
  - Such is the cost of raising an army of 100,000 men.
  - In the operations of war,
    - where there are in the field a thousand swift chariots,
    - as many heavy chariots,
    - and a hundred thousand mail-clad soldiers,
    - with provisions enough to carry them a thousand li,
  - The cost will reach the total of a thousand ounces of silver per day.
    - the expenditure at home and at the front,
    - including entertainment of guests,
    - small items such as glue and paint,
    - and sums spent on chariots and armor,
- [Duration]
  - 2. The purpose of fighting is winning
    - if victory is long in coming,
      - then men's weapons will grow dull and their ardor will be damped.
        - you will exhaust your strength If you lay siege to a town
    - 3. Again, if the campaign is protracted,
      - the resources of the State will not be equal to the strain.
  - 4. Now,
    - when your weapons are dulled,
    - your ardor damped
    - your strength exhausted
    - and your treasure spent,
    - Then no man, however wise, will be able to avert the consequences that must ensue.
      - other chieftains will spring up to take advantage of your extremity.

Mind Map 8: Aow Ch. II, the English Mind Map - Part 1



Thus, though we have heard of stupid haste in war,
cleverness has never been seen associated with long delays.

6. There is no instance of a country having benefited from prolonged warfare.

7. It is only one who is thoroughly acquainted with the evils of war that can thoroughly understand the profitable way of carrying it on.

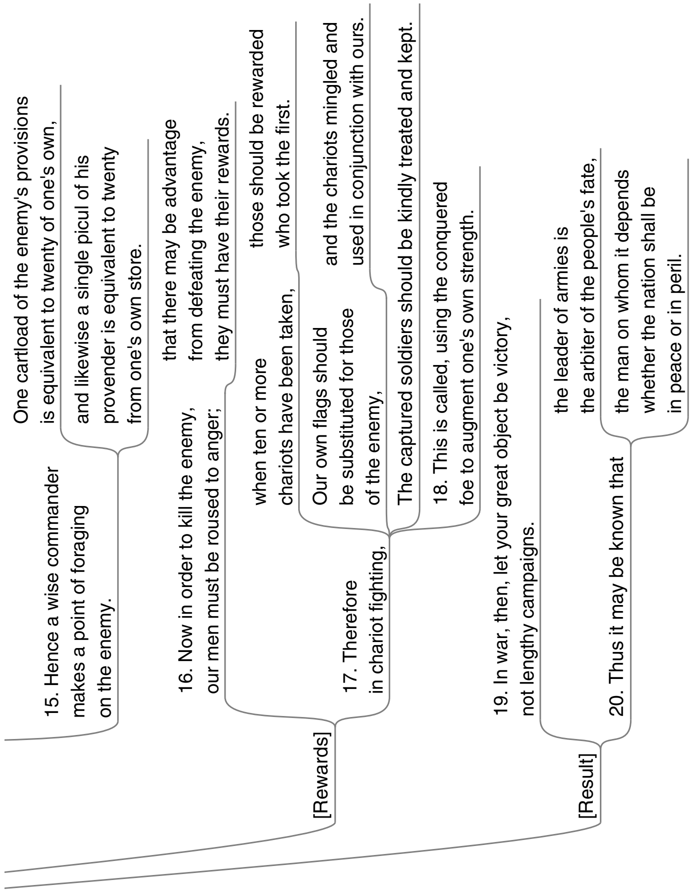
8. The skillful soldier
does not raise a second levy,
neither are his supply-wagons loaded more than twice.
9. Bring war material with you from home,
but forage on the enemy.
Thus the army will have food enough for its needs.

10. Poverty of the State exchequer causes an army to be maintained by contributions from a distance.
Contributing to maintain an army at a distance causes the people to be impoverished.

11. On the other hand, the proximity of an army causes prices to go up;
and high prices cause the people's substance to be drained away.

12. When their substance is drained away, he peasantry will be afflicted by heavy exactions.
three-tenths of people's income will be dissipated:
with this loss of substance
exhaustion of strength
the homes of the people will be stripped bare
while government expenses for ... will amount to four-tenths of its total revenue.
broken chariots,
worn-out horses,
breast-plates and helmets,
bows and arrows,
spears and shields,
protective mantles,
draught-oxen and heavy wagons,

Mind Map 9: Aow Ch. II, the English Mind Map - Part 2



15. Hence a wise commander makes a point of foraging on the enemy.
One cartload of the enemy's provisions is equivalent to twenty of one's own,
and likewise a single picul of his provender is equivalent to twenty from one's own store.

[Rewards]
16. Now in order to kill the enemy, our men must be roused to anger;
that there may be advantage from defeating the enemy, they must have their rewards.
17. Therefore in chariot fighting,
when ten or more chariots have been taken,
those should be rewarded who took the first.
Our own flags should be substituted for those of the enemy,
and the chariots mingled and used in conjunction with ours.
The captured soldiers should be kindly treated and kept.
18. This is called, using the conquered foe to augment one's own strength.

[Result]
19. In war, then, let your great object be victory, not lengthy campaigns.
20. Thus it may be known that
the leader of armies is the arbiter of the people's fate,
the man on whom it depends whether the nation shall be in peace or in peril.

Mind Map 10: Aow Ch. II, the English Mind Map - Part 3

Details and Patterns

Sun Tzu Said:

This chapter is involved with making preparations for war. Sun Tzu talks about the cost of raising an army, how the duration of a war affects its outcome, the necessary skills, the prices of goods during warfare, the rewards to be given to the army men, and the result obtained.

This chapter is sparse in patterns, there is a set of conditional patters, and the occurrence of 故 (gù) suggests a series of conditional sentences, which we will explore below.

Cost

We see an informal enumeration about the material and soldiers needed, and the price of it. Rather precise detail is given about wat the cost is of building an army. Of course this does not translate easily to concepts of modern times, for example, we do not know what the cost of a thousand ounces of silver per day really means, see figure 32.

It reminds readers of today though, that they should consider: *material, distance to travel, expense at home, and duration of the campaign* etc.

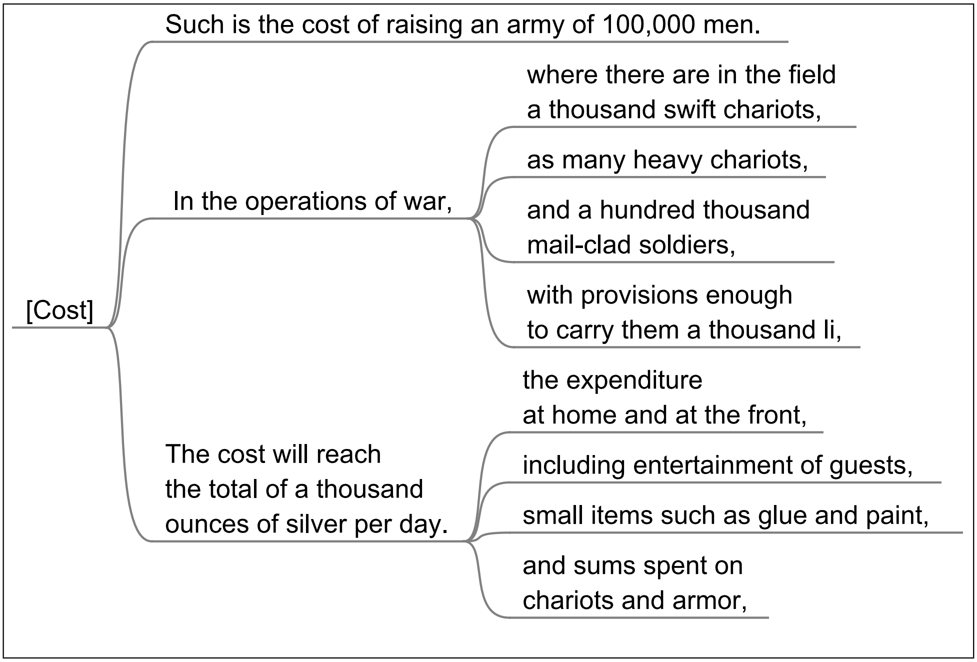

[Cost]
Such is the cost of raising an army of 100,000 men.
In the operations of war,
where there are in the field a thousand swift chariots,
as many heavy chariots,
and a hundred thousand mail-clad soldiers,
with provisions enough to carry them a thousand li,
The cost will reach the total of a thousand ounces of silver per day.
the expenditure at home and at the front,
including entertainment of guests,
small items such as glue and paint,
and sums spent on chariots and armor,

Fig. 32: Cost

Formally, we see these patterns:

- **Informal Enumeration**
  - par 1: Swift chariots, heavy chariots, mail-clad soldiers, provisions.
- **Conditional Sentences**
  - par. 1: `4 Cond. => Conseq.`

Duration

After looking at the cost, Sun Tzu looks at the duration of a war, see figure 33.

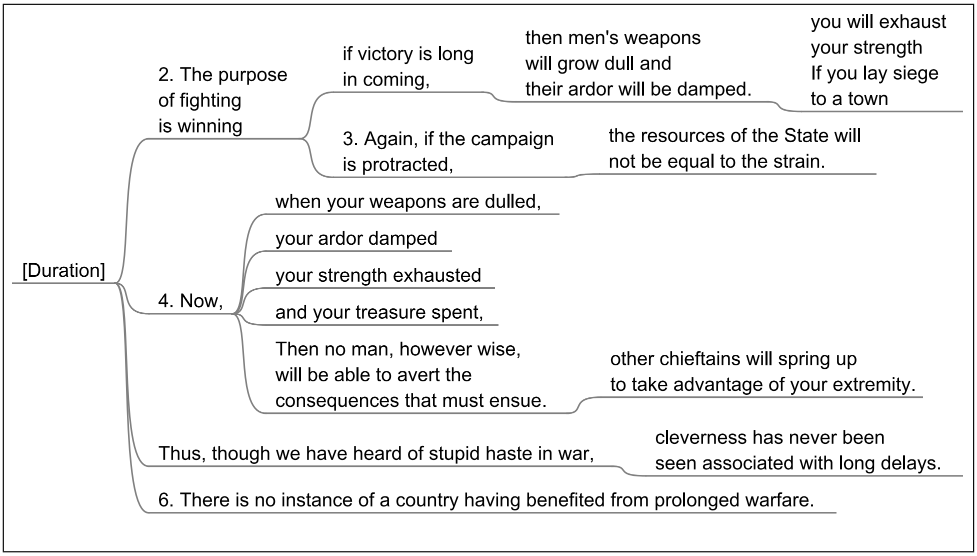

[Duration]
2. The purpose of fighting is winning
if victory is long in coming,
then men's weapons will grow dull and their ardor will be damped.
you will exhaust your strength If you lay siege to a town
3. Again, if the campaign is protracted,
the resources of the State will not be equal to the strain.
4. Now,
when your weapons are dulled,
your ardor damped
your strength exhausted
and your treasure spent,
Then no man, however wise, will be able to avert the consequences that must ensue.
other chieftains will spring up to take advantage of your extremity.
Thus, though we have heard of stupid haste in war,
cleverness has never been seen associated with long delays.
6. There is no instance of a country having benefited from prolonged warfare.

Fig. 33: Duration

Here we see several conditional sentences, such as: `if` the weapons become dull, `then` the men become tired, and the money is spent.

Sun Tzu repeats the conditional in almost the same words, and he adds a warning of dire consequences.

The orginal Giles translation of paragraph 2 starts as follows:

> 2. When you engage in actual fighting,...

However, according to Mair [46, p. 81] the first phrase is an affirmative:

> The purpose of engaging in battle is to win. If victory ...

Indeed, looking at the Chinese text: 其用战也贵胜, this sentence is not a conditional sentence as it seems to be in the Giles translation. Therefore, the translation is changed to read:

> 2. The purpose of fighting is winning ...

In paragraph 6, we find a conclusion, in Chinese starting with a 故 (gù) character:

> Thus, though we have heard of stupid haste in war, cleverness has never been seen associated with long delays.

Formally, the conditional sentences in paragraphs 1-6, look like this:

- **Conditional Sentences**
  - par. 2: `Cond. => 2 Conseq., Conseq. => Conseq.`
  - par. 3: `Conseq. => Conseq.`, as indicated by 则 (zé).
  - par. 4: `4 Cond. => 2 Conseq.`, indicated by 则 (zé).
  - Par. 5-6: `=> 2 Judge. (故)`, both affirmed by 也 (ye).

Skill

Some skills needed for successful warfare are the subject here.

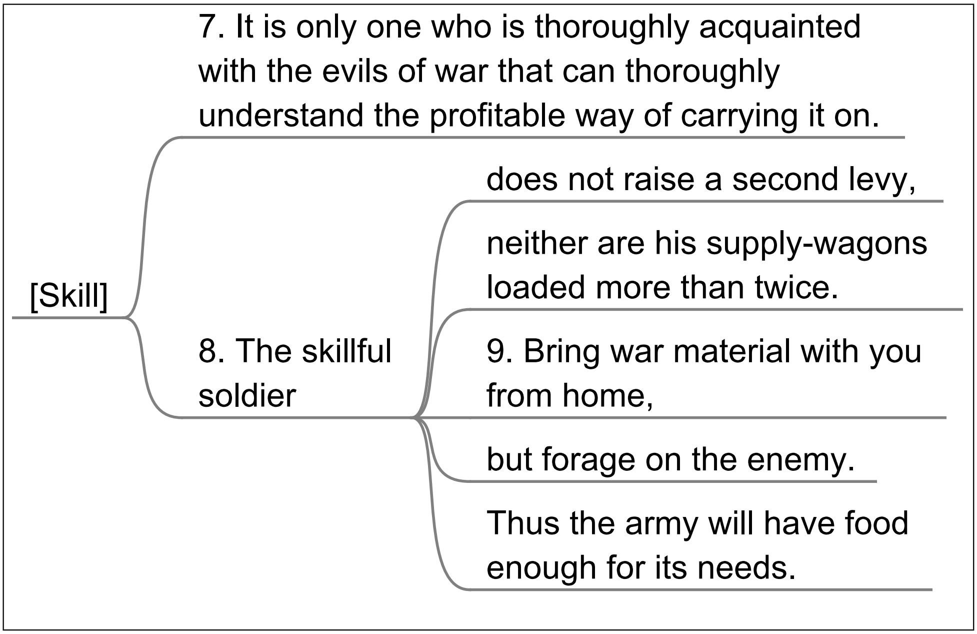

[Skill]
7. It is only one who is thoroughly acquainted with the evils of war that can thoroughly understand the profitable way of carrying it on.
8. The skillful soldier
does not raise a second levy,
neither are his supply-wagons loaded more than twice.
9. Bring war material with you from home,
but forage on the enemy.
Thus the army will have food enough for its needs.

Fig. 34: Skill

The subject of skill starts with a 故 (gù) character, indicating an Conditional Sentence. The assumption is that: *only one who is thoroughly acquainted with the evils of war* can profitably be commander of a war.

In paragraph 7, there is a reversed Conditional Sentence indicated by 也. This could lead to an alternative translation:

> Thoroughly understanding the most profitable way of carrying out a war, requires to be thoroughly being acquainted with its evils.

Summarizing:

- **Conditional Sentences**
  - Par. 7: `(Cond. => Cond) (故)`.
  - Par. 8-9: `4 Adv. => Cond`, affirmed by 也.

Prices

This section talks about the various circumstances that could influence the prices of food and war material. There is an informal enumeration for government expenses, see below.

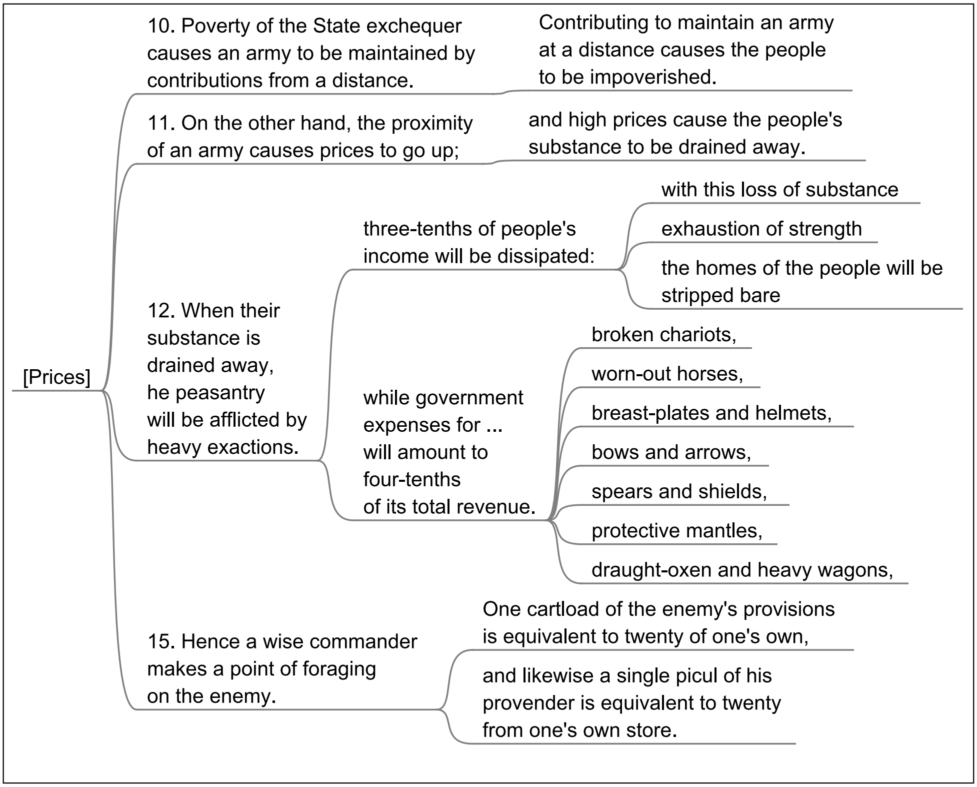

[Prices]
10. Poverty of the State exchequer causes an army to be maintained by contributions from a distance.
Contributing to maintain an army at a distance causes the people to be impoverished.
11. On the other hand, the proximity of an army causes prices to go up;
and high prices cause the people's substance to be drained away.
12. When their substance is drained away, he peasantry will be afflicted by heavy exactions.
three-tenths of people's income will be dissipated:
with this loss of substance
exhaustion of strength
the homes of the people will be stripped bare
while government expenses for ... will amount to four-tenths of its total revenue.
broken chariots,
worn-out horses,
breast-plates and helmets,
bows and arrows,
spears and shields,
protective mantles,
draught-oxen and heavy wagons,
15. Hence a wise commander makes a point of foraging on the enemy.
One cartload of the enemy's provisions is equivalent to twenty of one's own,
and likewise a single picul of his provender is equivalent to twenty from one's own store.

Fig. 35: Prices

This enumeration is part of another informal enumeration stating that three-tenths of the people's income will be dissipated and the government will lose four-tenths of its total revenue for the expenses mentioned above.

- **Informal Enumeration**
  - par 13-14: Broken chariots, worn-out horses, breast-plates and helmets, bows and arrows, spears and shields, protective mantles, draught-oxen and heavy wagons.
- **Informal Enumeration**
  - par 13-14: Three tenths, and four tenths, of income.
- **Conditional Sentences**
  - Par. 10: `Cond. => Cond, Cond. => Conseq.`, indicated by 则.
  - Par. 11: `2(Cond. => Conseq.)`, indicated by 则.
  - Par. 12: `Cond. => Conseq.`, indicated by 则.
  - Par. 13-14: `Cond. => 3 Conseq.`.
  - Par. 15: `=> Adv. (故)`, followed by a justification.

Rewards

This section discusses how to keep soldiers motivated.

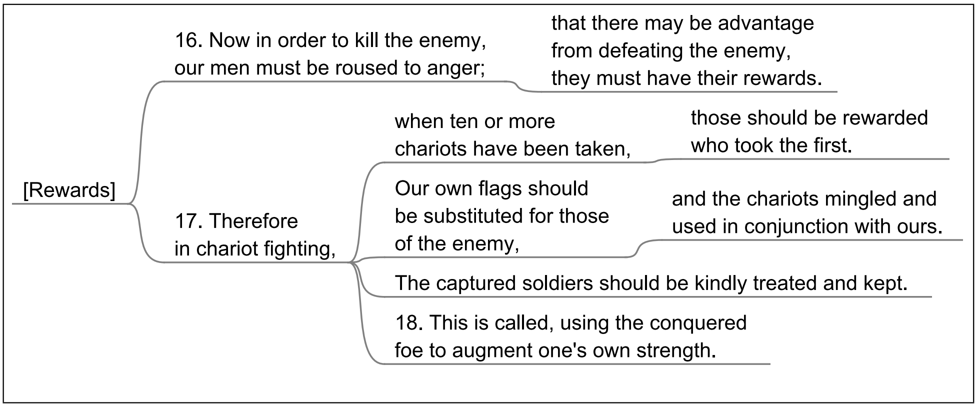

[Rewards]
16. Now in order to kill the enemy, our men must be roused to anger;
that there may be advantage from defeating the enemy, they must have their rewards.
17. Therefore in chariot fighting,
when ten or more chariots have been taken,
those should be rewarded who took the first.
Our own flags should be substituted for those of the enemy,
and the chariots mingled and used in conjunction with ours.
The captured soldiers should be kindly treated and kept.
18. This is called, using the conquered foe to augment one's own strength.

Fig. 36: Rewards

Our formal description of the Conditional Sentences:

- **Conditional Sentences**
  - Par. 16: `2(Cond. => Conseq.)`, reversed condition (也).
  - Par. 17-18: `(Cond. => 4 Adv.) (故)`.

Result

Here Sun Tzu has the final reasoning of this chapter. He stresses again, that a great leader is very important to a state, with the difference of peace or peril.

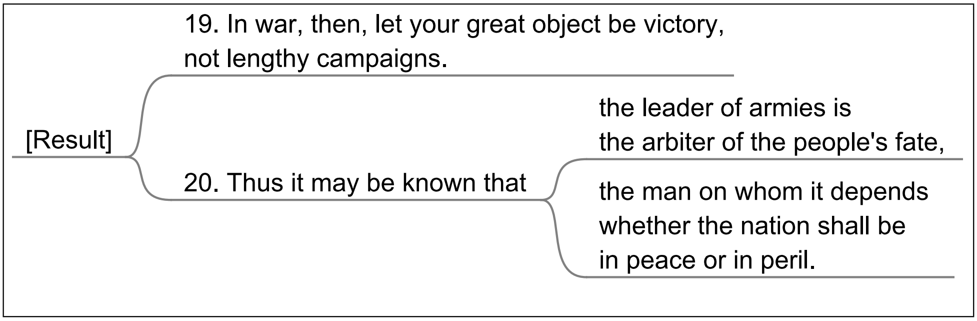

[Result]
19. In war, then, let your great object be victory, not lengthy campaigns.
20. Thus it may be known that
the leader of armies is the arbiter of the people's fate,
the man on whom it depends whether the nation shall be in peace or in peril.

Fig. 37: Result

- **Pairs of Opposites**
  - Par. 20: `=> Judge. （故）`, 也 indicates the essence of this judgement.
- **Conditional Sentences**
  - Par. 19: `=> Judge. （故）`, used as a summary of previous text.
  - Par. 20: Peace or peril.

Structured Text

II. WAGING WAR

- **1. Sun Tzu Said:**

- **Cost**

  Such is the cost of raising an army of 100,000 men.
  - » In the operations of war,
    - ° where there are in the field a thousand swift chariots,
    - ° as many heavy chariots,
    - ° and a hundred thousand mail-clad soldiers,
    - ° with provisions enough to carry them a thousand li,
  - » The cost will reach the total of a thousand ounces of silver per day.
    - ° the expenditure at home and at the front,
    - ° including entertainment of guests,
    - ° small items such as glue and paint,
    - ° and sums spent on chariots and armor,

- **Duration**

  2. The purpose of fighting is winning
  - » if victory is long in coming,
    - ° then men's weapons will grow dull and their ardor will be damped.
      - - you will exhaust your strength if you lay siege to a town.
  - » 3. Again, if the campaign is protracted,
    - ° the resources of the State will not be equal to the strain.

  4. Now,
  - » when your weapons are dulled,
  - » your ardor damped
  - » your strength exhausted
  - » and your treasure spent,
  - » Then no man, however wise, will be able to avert the consequences that must ensue.
    - ° other chieftains will spring up to take advantage of your extremity.

  5. Thus, though we have heard of stupid haste in war,
  - » cleverness has never been seen associated with long delays.

  6. There is no instance of a country having benefited from prolonged warfare.

- **Skill**

  7. It is only one who is thoroughly acquainted with the evils of war that can thoroughly understand the profitable way of carrying it on.

  8. The skillful soldier

- » does not raise a second levy,
- » neither are his supply-wagons loaded more than twice.
- » 9. Bring war material with you from home,
- » but forage on the enemy.
- » Thus the army will have food enough for its needs.

- **Prices**

  10. Poverty of the State exchequer causes an army to be maintained by contributions from a distance.
  - » Contributing to maintain an army at a distance causes the people to be impoverished.

  11. On the other hand, the proximity of an army causes prices to go up;
  - » and high prices cause the people's substance to be drained away.

  12. When their substance is drained away, the peasantry will be afflicted by heavy exactions.
  - » three-tenths of people's income will be dissipated:
    - ° with this loss of substance
    - ° exhaustion of strength
    - ° the homes of the people will be stripped bare
  - » while government expenses for ...will amount to four-tenths of its total revenue.
    - ° broken chariots,
    - ° worn-out horses,
    - ° breast-plates and helmets,
    - ° bows and arrows,
    - ° spears and shields,
    - ° protective mantles,
    - ° draught-oxen and heavy wagons,

  15. Hence a wise commander makes a point of foraging on the enemy.
  - » One cartload of the enemy's provisions is equivalent to twenty of one's own,
  - » and likewise a single picul of his provender is equivalent to twenty from one's own store.

- **Rewards**

  16. Now in order to kill the enemy, our men must be roused to anger;
  - » that there may be advantage from defeating the enemy, they must have their rewards.

  17. Therefore in chariot fighting,
  - » when ten or more chariots have been taken,
    - ° those should be rewarded who took the first.
  - » Our own flags should be substituted for those of the enemy,
    - ° and the chariots mingled and used in conjunction with ours.
  - » The captured soldiers should be kindly treated and kept.
  - » 18. This is called, using the conquered foe to augment one's own strength.

- **Result**

  ```
  19. In war, then, let your great object be victory, not
  lengthy campaigns.
  20. Thus it may be known that
    » the leader of armies is the arbiter of the people's
      fate,
    » the man on whom it depends whether the nation shall
      be in peace or in peril.
  ```

III. PLANNING ATTACK - 謀攻

Abstract This chapter consists mainly of various reasonings, as indicated by the frequent occurrence of 故 (gù), therefore (9 times).

Making decisions in Longzhong.

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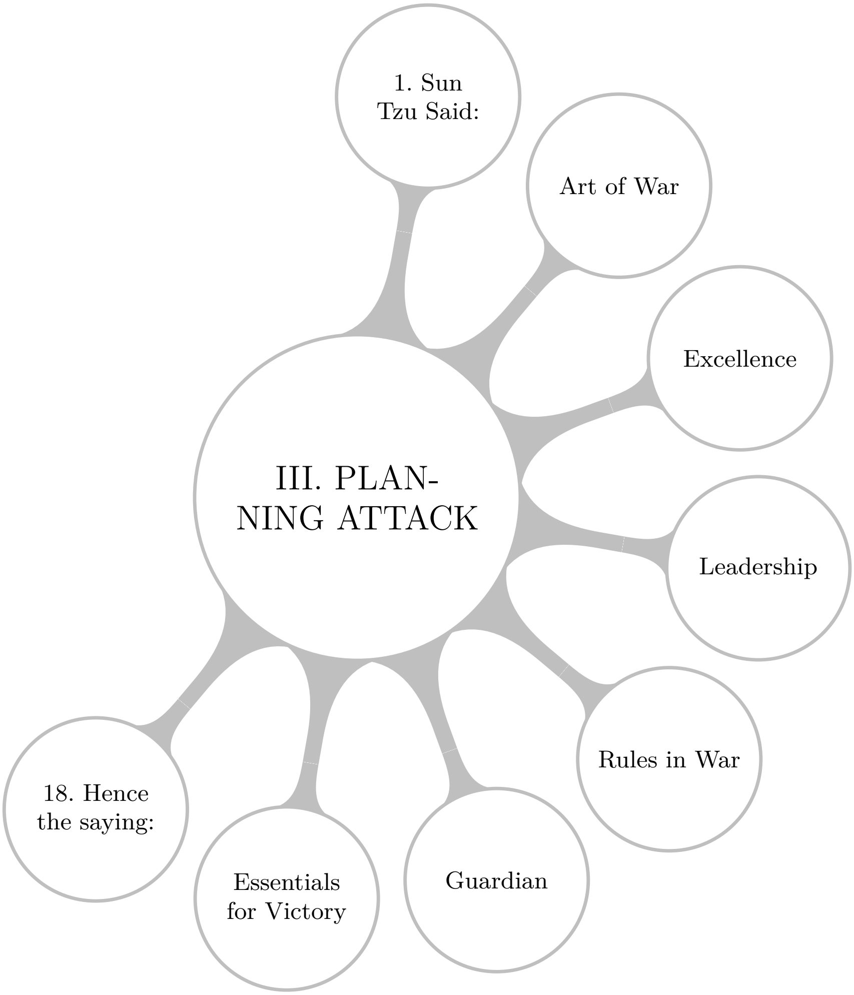
P. van Emde Boas et al., *Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps*, Logic in Asia: Studia Logica Library,
https://doi.org/10.1007/978-981-19-6250-9_13

Main Concepts


1. Sun Tzu Said:
Art of War
Excellence
III. PLANNING ATTACK
Leadership
Rules in War
Guardian
Essentials for Victory
18. Hence the saying:

Overview of the Contents

This chapter is again about planning. It involves considerations that a peaceful solution is always superior to war, that an enemy should only be attacked when it is certain that you will win, never attack walled cities, and disobey the ruler when you must.

We cite the Aow Ch.III, par. 1:

```
It is better to capture a country intact,
  » than to destroy a country;
  ...
```

And, the AoW Ch.III, par.2:

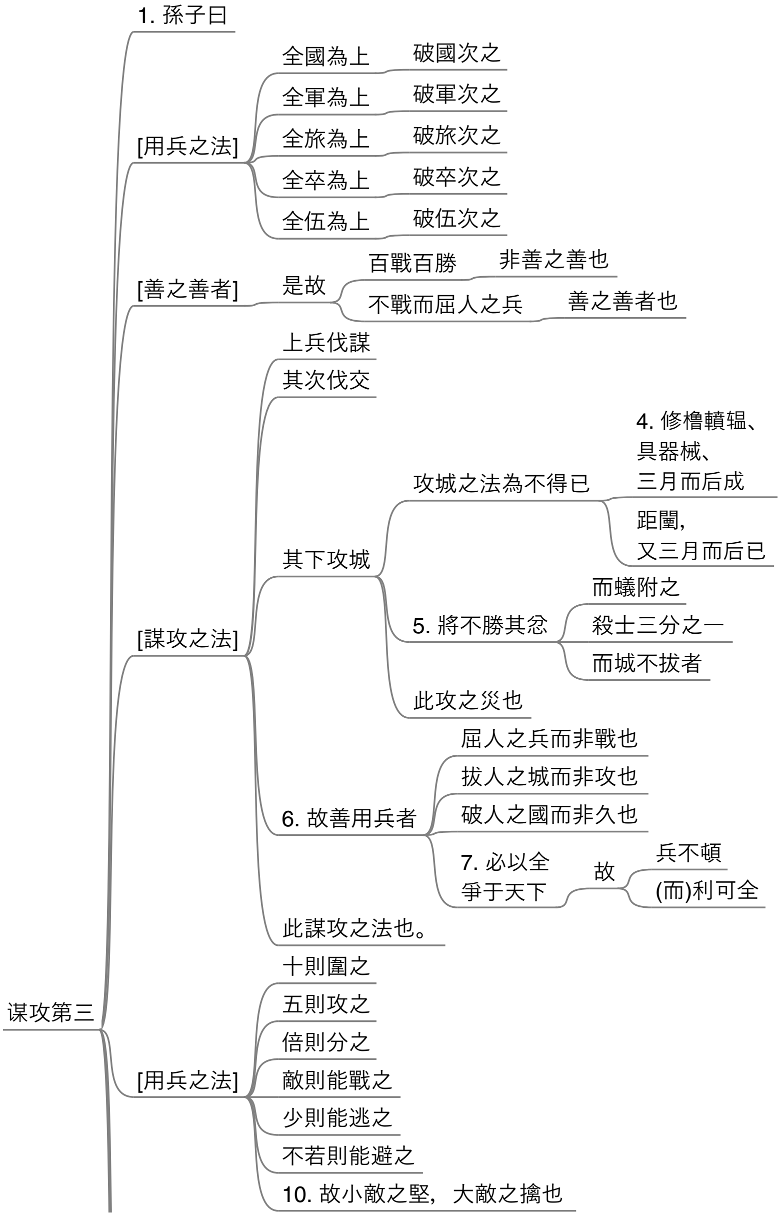
2. Therefore, to fight and conquer in all your battles
    - is not supreme excellence;
    - supreme excellence consists in breaking the enemy's resistance without fighting.

A famous quote of Sun Tzu can be found at the end of this chapter, Aow Ch.III, par. 18:

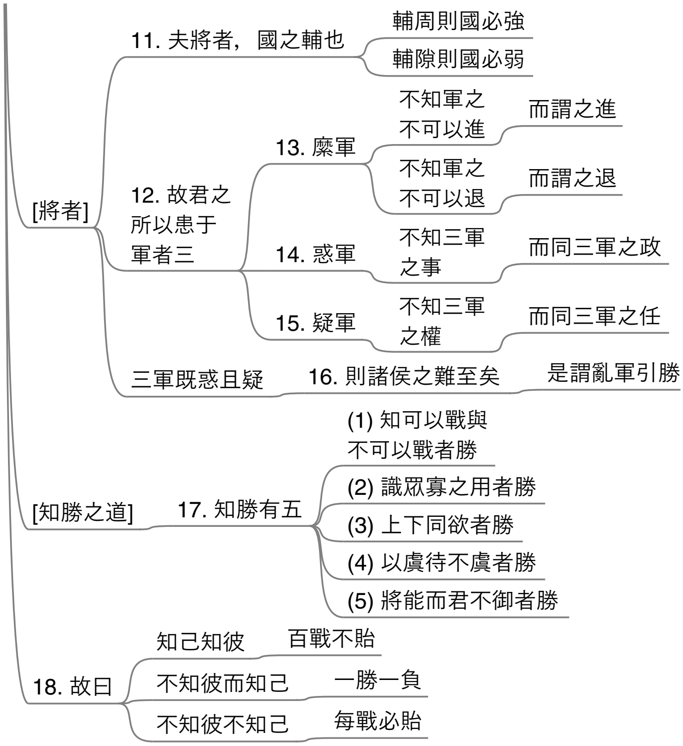
If you know the enemy and know yourself, you need not
fear the result of a hundred battles.
If you know yourself but not the enemy, for every
victory gained you will also suffer a defeat.
If you know neither the enemy nor yourself, you will
succumb in every battle.

The Mind Maps

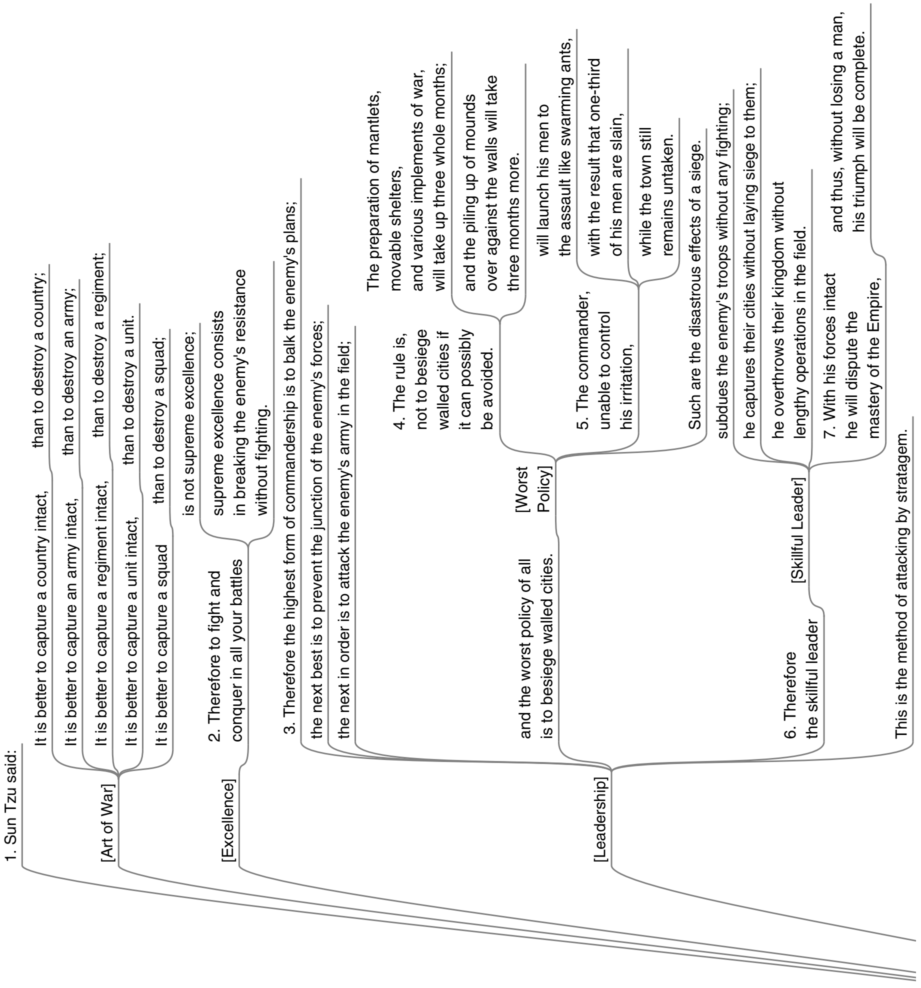
The overview for this chapter can be found in mind map figures 11 to 15.


谋攻第三
1. 孫子日
[用兵之法]
全國為上
破國次之
全軍為上
破軍次之
全旅為上
破旅次之
全卒為上
破卒次之
全伍為上
破伍次之
[善之善者]
是故
百戰百勝
非善之善也
不戰而屈人之兵
善之善者也
[謀攻之法]
上兵伐謀
其次伐交
其下攻城
攻城之法為不得已
4. 修櫓轒轀、
具器械、
三月而后成
距闉,
又三月而后已
5. 將不勝其忿
而蟻附之
殺士三分之一
而城不拔者
此攻之災也
6. 故善用兵者
屈人之兵而非戰也
拔人之城而非攻也
破人之國而非久也
7. 必以全
爭于天下
故
兵不頓
(而)利可全
此謀攻之法也。
[用兵之法]
十則圍之
五則攻之
倍則分之
敵則能戰之
少則能逃之
不若則能避之
10. 故小敵之堅，大敵之擒也

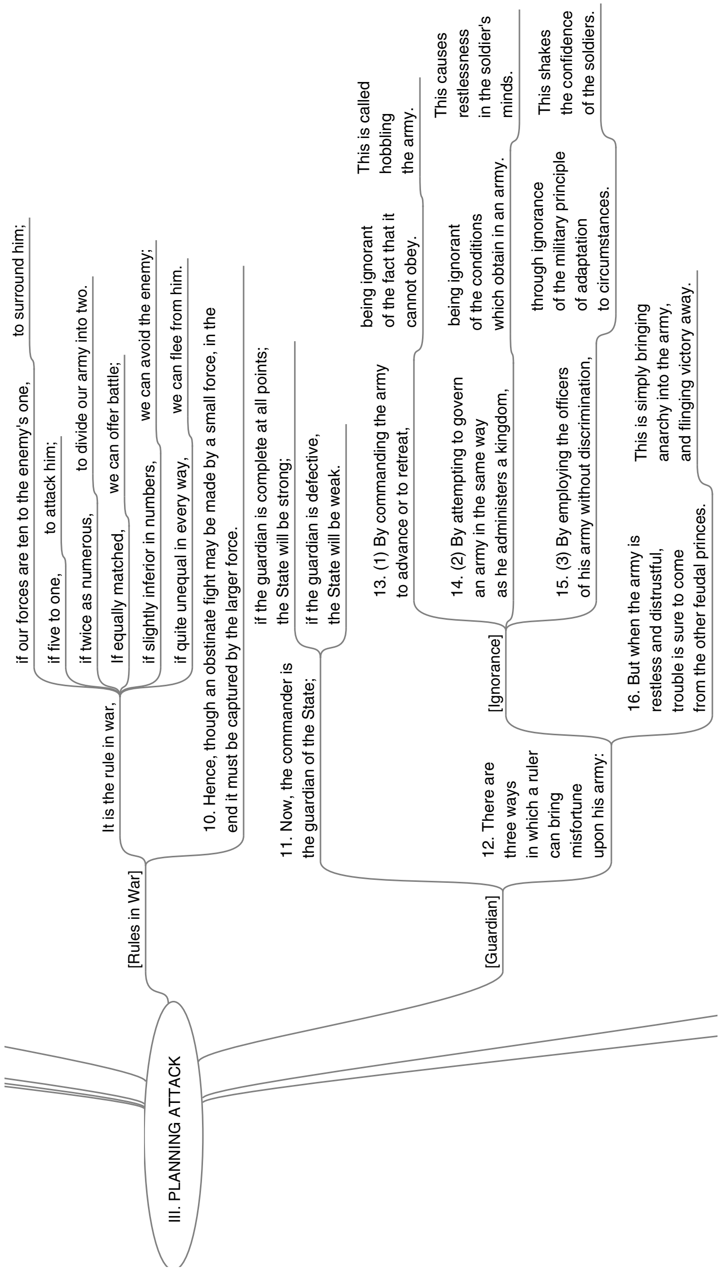
Mind Map 11: AoW Chapter III - Chinese Mind Map - Part 1


11. 夫將者，國之輔也
輔周則國必強
輔隙則國必弱
[將者]
12. 故君之所以患于軍者三
13. 縻軍
不知軍之不可以進
而謂之進
不知軍之不可以退
而謂之退
14. 惑軍
不知三軍之事
而同三軍之政
15. 疑軍
不知三軍之權
而同三軍之任
三軍既惑且疑
16. 則諸侯之難至矣
是謂亂軍引勝
[知勝之道]
17. 知勝有五
(1) 知可以戰與不可以戰者勝
(2) 識眾寡之用者勝
(3) 上下同欲者勝
(4) 以虞待不虞者勝
(5) 將能而君不御者勝
18. 故曰
知己知彼
百戰不貽
不知彼而知己
一勝一負
不知彼不知己
每戰必貽

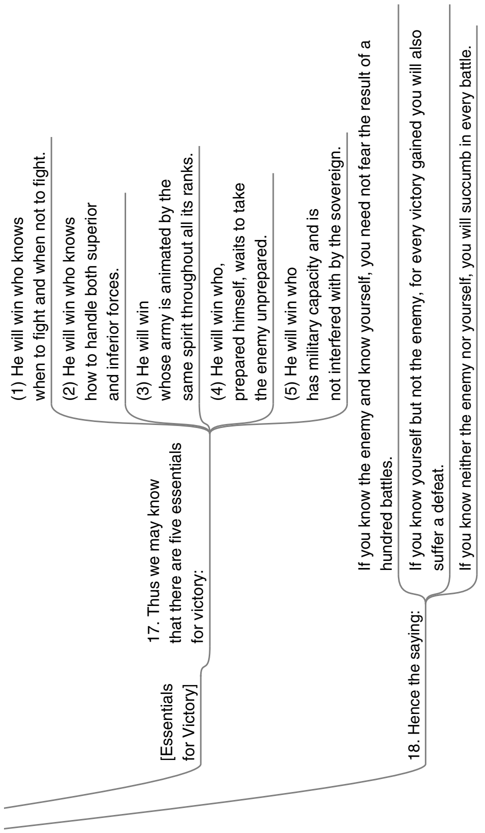
Mind Map 12: AoW Chapter III - Chinese Mind Map Part 2


1. Sun Tzu said:
[Art of War]
It is better to capture a country intact,
than to destroy a country;
It is better to capture an army intact,
than to destroy an army;
It is better to capture a regiment intact,
than to destroy a regiment;
It is better to capture a unit intact,
than to destroy a unit.
It is better to capture a squad
than to destroy a squad;
[Excellence]
2. Therefore to fight and conquer in all your battles
is not supreme excellence;
supreme excellence consists in breaking the enemy's resistance without fighting.
[Leadership]
3. Therefore the highest form of commandership is to balk the enemy's plans;
the next best is to prevent the junction of the enemy's forces;
the next in order is to attack the enemy's army in the field;
and the worst policy of all is to besiege walled cities.
[Worst Policy]
4. The rule is, not to besiege walled cities if it can possibly be avoided.
The preparation of mantlets, movable shelters, and various implements of war, will take up three whole months;
and the piling up of mounds over against the walls will take three months more.
5. The commander, unable to control his irritation,
will launch his men to the assault like swarming ants,
with the result that one-third of his men are slain,
while the town still remains untaken.
Such are the disastrous effects of a siege.
6. Therefore the skillful leader
[Skillful Leader]
subdues the enemy's troops without any fighting;
he captures their cities without laying siege to them;
he overthrows their kingdom without lengthy operations in the field.
7. With his forces intact he will dispute the mastery of the Empire,
and thus, without losing a man, his triumph will be complete.
This is the method of attacking by stratagem.

Mind Map 13: Aow Ch. III - The English Mind Map Part 1


III. PLANNING ATTACK
[Rules in War]
It is the rule in war,
if our forces are ten to the enemy's one,
to surround him;
if five to one,
to attack him;
if twice as numerous,
to divide our army into two.
If equally matched,
we can offer battle;
if slightly inferior in numbers,
we can avoid the enemy;
if quite unequal in every way,
we can flee from him.
10. Hence, though an obstinate fight may be made by a small force, in the end it must be captured by the larger force.
[Guardian]
11. Now, the commander is the guardian of the State;
if the guardian is complete at all points;
the State will be strong;
if the guardian is defective,
the State will be weak.
12. There are three ways in which a ruler can bring misfortune upon his army:
[Ignorance]
13. (1) By commanding the army to advance or to retreat,
being ignorant of the fact that it cannot obey.
This is called hobbling the army.
14. (2) By attempting to govern an army in the same way as he administers a kingdom,
being ignorant of the conditions which obtain in an army.
This causes restlessness in the soldier's minds.
15. (3) By employing the officers of his army without discrimination,
through ignorance of the military principle of adaptation to circumstances.
This shakes the confidence of the soldiers.
16. But when the army is restless and distrustful, trouble is sure to come from the other feudal princes.
This is simply bringing anarchy into the army, and flinging victory away.

Mind Map 14: Aow Ch. III - The English Mind Map - Part 2


[Essentials for Victory]
17. Thus we may know that there are five essentials for victory:
(1) He will win who knows when to fight and when not to fight.
(2) He will win who knows how to handle both superior and inferior forces.
(3) He will win whose army is animated by the same spirit throughout all its ranks.
(4) He will win who, prepared himself, waits to take the enemy unprepared.
(5) He will win who has military capacity and is not interfered with by the sovereign.
18. Hence the saying:
If you know the enemy and know yourself, you need not fear the result of a hundred battles.
If you know yourself but not the enemy, for every victory gained you will also suffer a defeat.
If you know neither the enemy nor yourself, you will succumb in every battle.

Mind Map 15: Aow Ch. III - The English Mind Map - Part 3

Details and Patterns

The title used in the Giles translation [23], is *Attack by Stratagem*. Stratagem means plan, deception, or ruse in the context of preparing for war. Therefore, this chapter is again about planning and preparation.

We see various reasonings, as indicated by the frequent occurrence of 故 (gù), therefore (9x).

Sun Tzu Said:

A remarkable feature of this chapter is that is contains several *preference order* patterns, while there is only one clear other occurrence of this pattern: in AoW Ch.I.

We found an ordering of actions for capturing things in paragraph 1; what a good leader should do when considering to fight; and a numbering rule when matching the size of the enemy's army with your own.

There are enumerations that do not necessarily have a preference order, such as the three ways of misfortune in paragraph 12, and the five essentials for victory in paragraph 17.

The famous sentence that end this chapter, see figure 47 can be seen as having an ordering too: be sure that you know both yourself and the enemy. If one of those is lacking, your chances for victory will diminish,

- **Conditional Sentences**
    - Par. 1: Universal quantification 凡: in each war; Preference order.

Art of War

The chapter starts with this text in the Giles translation:

> In the practical art of war, It is better to capture a country intact, than to destroy a country; It is better to capture an army intact, than to destroy an army; It is better to capture a regiment intact, than to destroy a regiment; It is better to capture a unit intact, than to destroy a unit. It is better to capture a squad than to destroy a squad;

This example orders five elements: 國，軍，旅，卒，伍。These five terms refer to five organizational units in the ancient Chinese armies.

國 is the entire country, 軍 is the full army of the country, 旅 is one sub-unit of the country, the last two are smaller units.

For each of the elements, to keep it intact is better than to destroy it. Taking all the five elements into consideration, to keep the higher ordered one intact is preferable to keeping the lower ones.

This constructs a *preference order* of the five elements, where each element is a conditional sentence. This analysis allows us now to structure the English mind map, and the translated text.

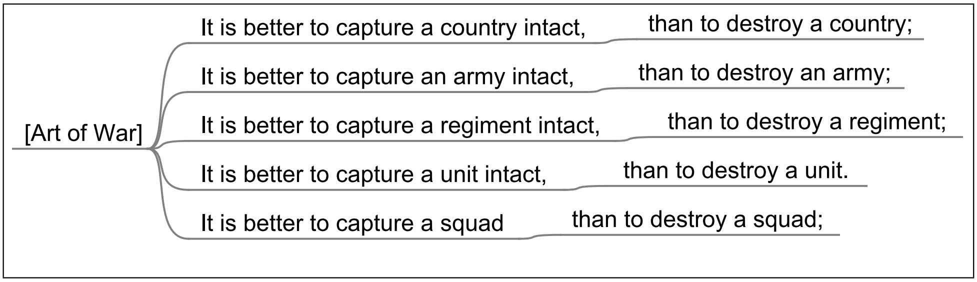

[Art of War]
It is better to capture a country intact,
than to destroy a country;
It is better to capture an army intact,
than to destroy an army;
It is better to capture a regiment intact,
than to destroy a regiment;
It is better to capture a unit intact,
than to destroy a unit.
It is better to capture a squad
than to destroy a squad;

Fig. 38: Art of War

The mind map in figure 38 shows this structure.

Excellence

This paragraph is a conclusion about what is said in the previous paragraph. We can conclude that because of the use of the 故 (gù) character, which indicates an *Conditional Sentence with* 故 pattern.

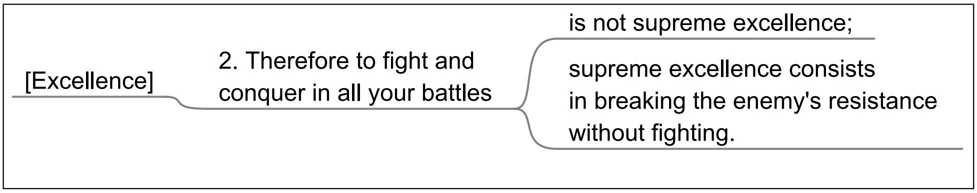

[Excellence]
2. Therefore to fight and conquer in all your battles
is not supreme excellence;
supreme excellence consists in breaking the enemy's resistance without fighting.

Fig. 39: Excellence

- **Conditional Sentences**
  - Par. 2: `=> 2 Judge. (故)`.

Leadership

Next, Sun Tzu turns his attention to leadership, in the Giles translation (par. 3) it continues like this:

> Thus, the highest form of generalship is to balk the enemy's plans; the next best is to prevent the junction of the enemy's forces; the next in order is to attack the enemy's army in the field; and the worst policy of all is to besiege walled cities.

Note: Balk is not such a common word now, it means something like: frustrate, resist. We did not change the word in our translation.

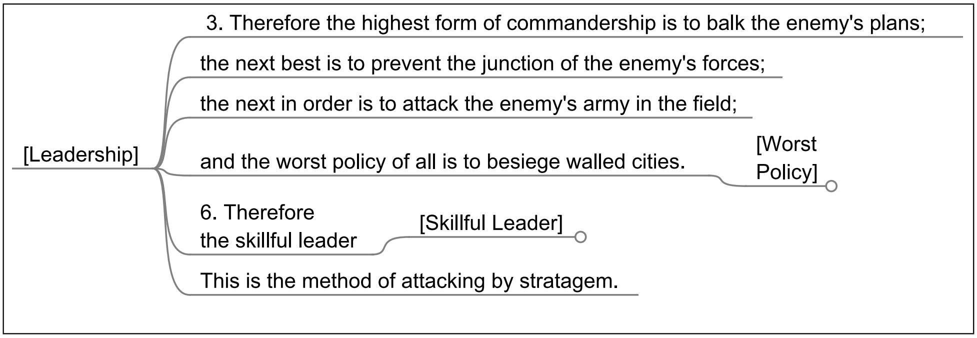

[Leadership]
3. Therefore the highest form of commandership is to balk the enemy's plans;
the next best is to prevent the junction of the enemy's forces;
the next in order is to attack the enemy's army in the field;
and the worst policy of all is to besiege walled cities.
[Worst Policy]
6. Therefore the skillful leader
[Skillful Leader]
This is the method of attacking by stratagem.

Fig. 40: Leadership

The mind map fragment can be found in figure 40. Details about the *worst policy* for a leader can be found in figure 41. The mind map fragment in figure 42 shows the characteristics of a skillful leader, which is also part of the *leadership* subject.

The sentences order four strategies, in this order:

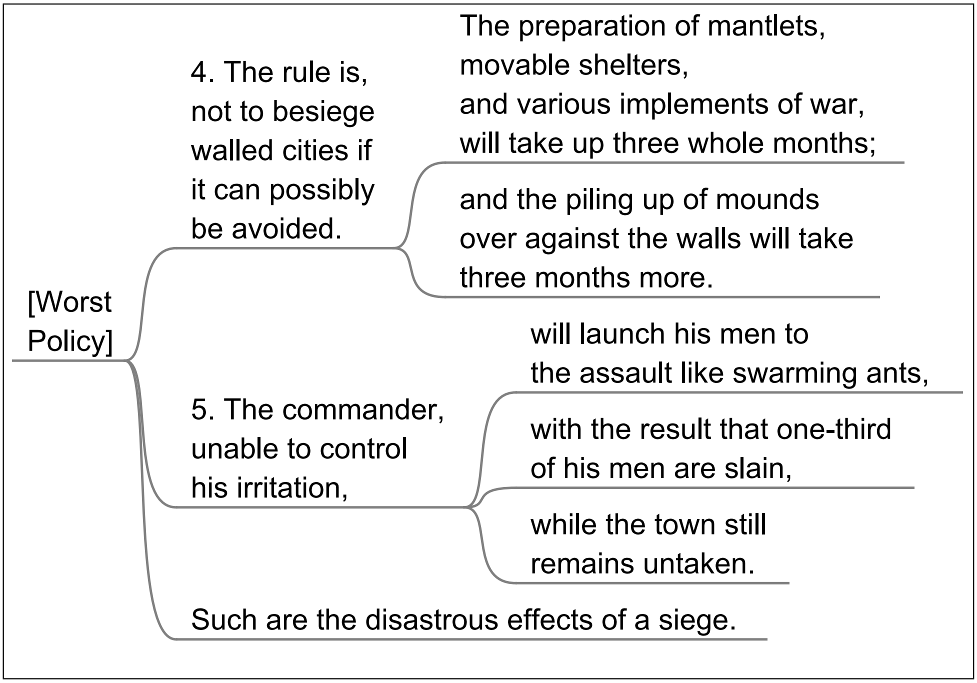
1. Frustrate the planning of the enemy,
2. Prevent the forces of the enemy to join each other,
3. Attack the enemy's army in the field;
4. Besiege a city.

The world is not a perfect one, therefore when the best scenario cannot happen, Sun Tzu proposes a second-best one, and then a next one. Thus one does not have to drop to the worst option immediately.

By *preference order*, Sun Tzu provides a more refined granular view of strategies. It is not about A or not A, but we can rate them from the more preferable to the least preferable, and the opportunity to make a sub-optimal scenario happen when a better scenario is not possible.

Note: a mantlet is a portable bulletproof shelter, or, as there were no bullets at the time, probably an arrow-proof shelter.

- **Conditional Sentences**
  - Par. 3: `=> Judge. (故)` .
    The judgement is a **preference order**.
  - Par. 4: `Adv.` .
  - Par. 5: `Cond. => 3 Conseq.` .
  - Par. 6: `=> 3 Adv. (故)`
    The three actions are composite: **Cond. => Conseq.** where 也 indicates a reversed implication.
  - Par. 7: `Cond. => Conseq. (故)` .
    也 indicates the essence of the sentences.



[Worst Policy]

4. The rule is, not to besiege walled cities if it can possibly be avoided.

The preparation of mantlets, movable shelters, and various implements of war, will take up three whole months;

and the piling up of mounds over against the walls will take three months more.

5. The commander, unable to control his irritation,

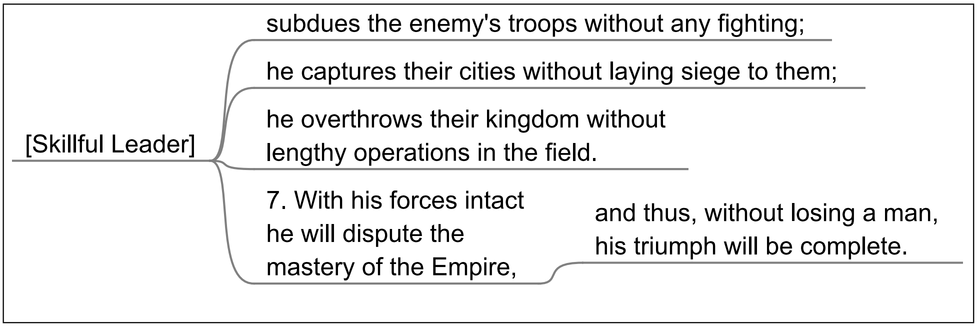
will launch his men to the assault like swarming ants,

with the result that one-third of his men are slain,

while the town still remains untaken.

Such are the disastrous effects of a siege.

Fig. 41: Leadership, Worst Policy



[Skillful Leader]

subdues the enemy's troops without any fighting;

he captures their cities without laying siege to them;

he overthrows their kingdom without lengthy operations in the field.

7. With his forces intact he will dispute the mastery of the Empire,

and thus, without losing a man, his triumph will be complete.

Fig. 42: Leadership, skillful leader

Rules in War

This subsection gives rules for actions to take, depending on the amount of men the enemy has relative to the amount of men of your own army.

- **Conditional Sentences**
  - Par. 8-9: `6(Cond. => Adv.) (故)`.
  - Par. 10: `=> Judge. (故)`.

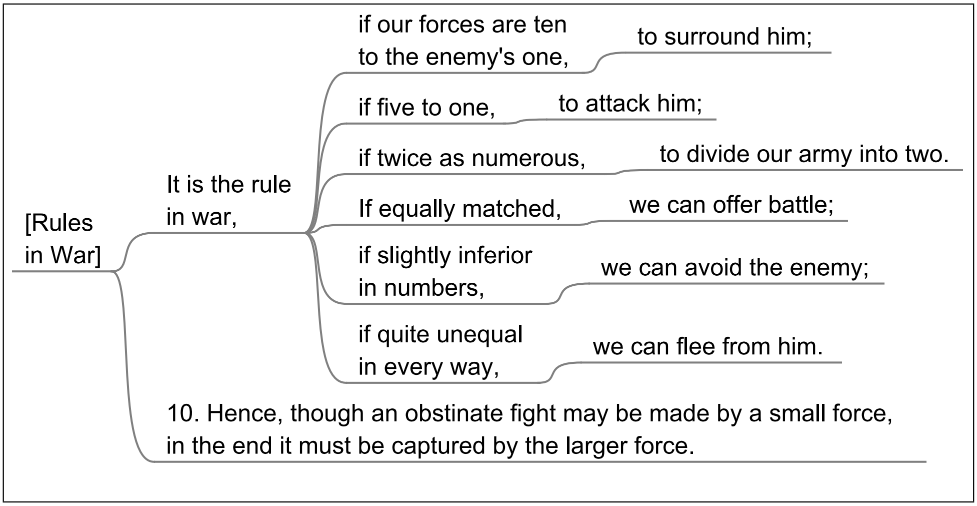

[Rules in War]
It is the rule in war,
if our forces are ten to the enemy's one,
to surround him;
if five to one,
to attack him;
if twice as numerous,
to divide our army into two.
If equally matched,
we can offer battle;
if slightly inferior in numbers,
we can avoid the enemy;
if quite unequal in every way,
we can flee from him.
10. Hence, though an obstinate fight may be made by a small force, in the end it must be captured by the larger force.

Fig. 43: Rules in War

Guardian

The commander as the guardian of the State must have a strong and complete character, for the state to be strong.

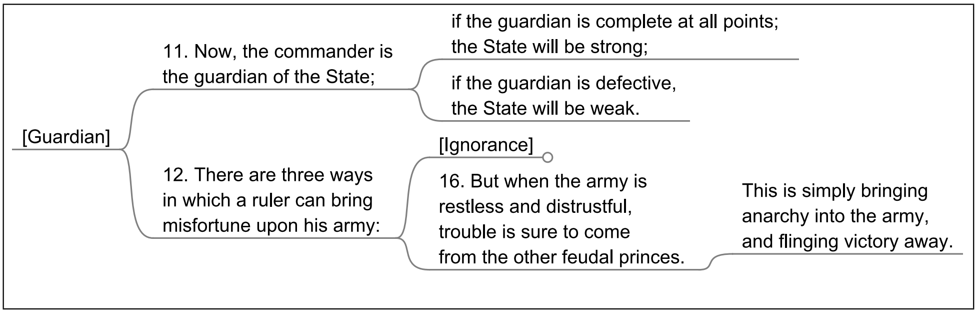

[Guardian]
11. Now, the commander is the guardian of the State;
if the guardian is complete at all points; the State will be strong;
if the guardian is defective, the State will be weak.
12. There are three ways in which a ruler can bring misfortune upon his army:
[Ignorance]
16. But when the army is restless and distrustful, trouble is sure to come from the other feudal princes.
This is simply bringing anarchy into the army, and flinging victory away.

Fig. 44: Guardian - Overview

There are however three ways in which a commander can fail, all three based on ignorance of the commander. Sun Tzu uses an enumeration pattern to list them.

- **Enumeration**
  - Par. 12: Ignorance.
- **Conditional Sentences**
  - Par. 11: `(2(Cond. => Conseq.)`, if-then-else construction.
  - Par. 12: `=> Judge. (故)`.
  - Par. 13-15: `3(Cond. => Conseq.)`.
  - Par. 16: `Cond. => Conseq.`.

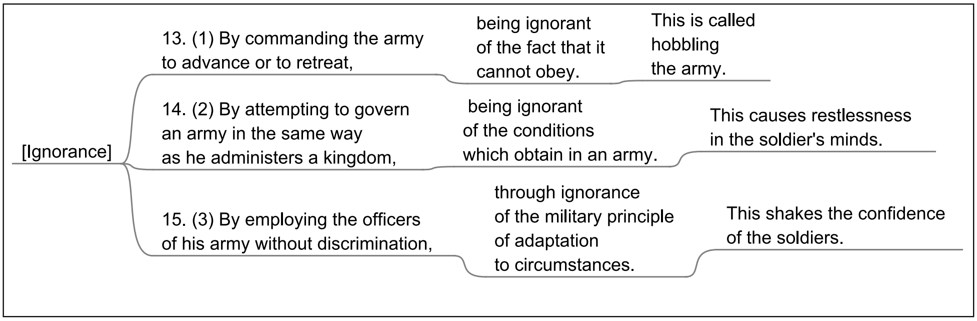

[Ignorance]
13. (1) By commanding the army to advance or to retreat,
being ignorant of the fact that it cannot obey.
This is called hobbling the army.
14. (2) By attempting to govern an army in the same way as he administers a kingdom,
being ignorant of the conditions which obtain in an army.
This causes restlessness in the soldier's minds.
15. (3) By employing the officers of his army without discrimination,
through ignorance of the military principle of adaptation to circumstances.
This shakes the confidence of the soldiers.

Fig. 45: Guardian - Three Ways of Ignorance

Essentials for Victory

In this section Sun Tzu uses another enumeration pattern to list the five essentials for victory.

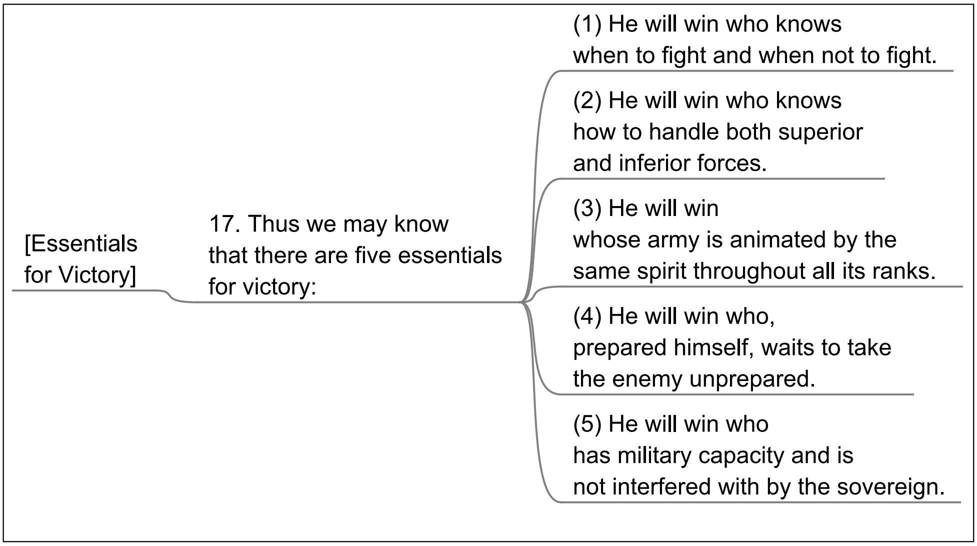
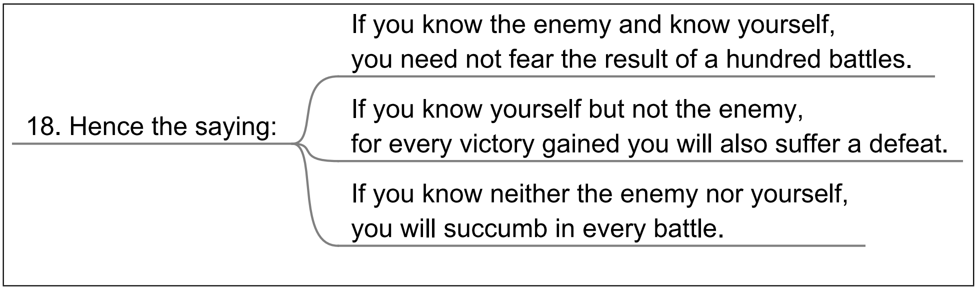

[Essentials for Victory]
17. Thus we may know that there are five essentials for victory:
(1) He will win who knows when to fight and when not to fight.
(2) He will win who knows how to handle both superior and inferior forces.
(3) He will win whose army is animated by the same spirit throughout all its ranks.
(4) He will win who, prepared himself, waits to take the enemy unprepared.
(5) He will win who has military capacity and is not interfered with by the sovereign.

Fig. 46: Essentials for Victory

- **Conditional Sentences**
  - Par. 17: `5(Cond. <= Conseq.) (故)`
    Only in the English translation.

Hence the Saying:

The chapter ends with a philosophical and often quoted saying, using a conditional pattern.



18. Hence the saying:

If you know the enemy and know yourself,
you need not fear the result of a hundred battles.

If you know yourself but not the enemy,
for every victory gained you will also suffer a defeat.

If you know neither the enemy nor yourself,
you will succumb in every battle.

Fig. 47: Hence the saying:

- **Conditional Sentences**
  - Par. 18: `3(Cond. => Conseq.) (故)`.

Structured Text

III. PLANNING ATTACK

- **1. Sun Tzu Said:**

- **Art of War**

  It is better to capture a country intact,
    » than to destroy a country;
  It is better to capture an army intact,
    » than to destroy an army;
  It is better to capture a regiment intact,
    » than to destroy a regiment;
  It is better to capture a unit intact,
    » than to destroy a unit.
  It is better to capture a squad
    » than to destroy a squad;

- **Excellence**

  2. Therefore, to fight and conquer in all your battles
    » is not supreme excellence;
    » supreme excellence consists in breaking the enemy's resistance without fighting.

- **Leadership**

  3. Therefore the highest form of commandership is to balk the enemy's plans;
  the next best is to prevent the junction of the enemy's forces;
  the next in order is to attack the enemy's army in the field;
  and the worst policy of all is to besiege walled cities.
    » 4. The rule is, not to besiege walled cities if it can possibly be avoided.
      ° The preparation of mantlets, movable shelters, and various implements of war, will take up three whole months;
      ° and the piling up of mounds over against the walls will take three months more.
    » 5. The commander, unable to control his irritation,
      ° will launch his men to the assault like swarming ants,
      ° with the result that one-third of his men are slain,
      ° while the town still remains untaken.
    » Such are the disastrous effects of a siege.
  6. Therefore the skillful leader
    » subdues the enemy's troops without any fighting;
    » he captures their cities without laying siege to them;
    » he overthrows their kingdom without lengthy operations in the field.

```
  » 7. With his forces intact he will dispute the
    mastery of the Empire,
    ° and thus, without losing a man, his triumph will
      be complete.
This is the method of attacking by stratagem.
```

- **Rules in War**

```
It is the rule in war,
  » if our forces are ten to the enemy's one,
    ° to surround him;
  » if five to one,
    ° to attack him;
  » if twice as numerous,
    ° to divide our army into two.
  » If equally matched,
    ° we can offer battle;
  » if slightly inferior in numbers,
    ° we can avoid the enemy;
  » if quite unequal in every way,
    ° we can flee from him.
10. Hence, though an obstinate fight may be made by a
small force, in the end it must be captured by the
larger force.
```

- **Guardian**

```
11. Now, the commander is the guardian of the State;
  » if the guardian is complete at all points; the
    State will be strong;
  » if the guardian is defective, the State will be
    weak.
12. There are three ways in which a ruler can bring
misfortune upon his army:
  » [Ignorance]
    ° 13. (1) By commanding the army to advance or to
      retreat,
      - being ignorant of the fact that it cannot obey.
        - This is called hobbling the army.
    ° 14. (2) By attempting to govern an army in the
      same way as he administers a kingdom,
      - being ignorant of the conditions which obtain in
        an army.
        - This causes restlessness in the soldier's
          minds.
    ° 15. (3) By employing the officers of his army
      without discrimination,
      - through ignorance of the military principle of
        adaptation to circumstances.
        - This shakes the confidence of the soldiers.
  » 16. But when the army is restless and distrustful,
    trouble is sure to come from the other feudal princes.
    ° This is simply bringing anarchy into the army,
      and flinging victory away.
```

- **Essentials for Victory**

17. Thus we may know that there are five essentials for victory:

- (1) He will win who knows when to fight and when not to fight.
- (2) He will win who knows how to handle both superior and inferior forces.
- (3) He will win whose army is animated by the same spirit throughout all its ranks.
- (4) He will win who, prepared himself, waits to take the enemy unprepared.
- (5) He will win who has military capacity and is not interfered with by the sovereign.

- **18. Hence the Saying:**

If you know the enemy and know yourself, you need not fear the result of a hundred battles.
If you know yourself but not the enemy, for every victory gained you will also suffer a defeat.
If you know neither the enemy nor yourself, you will succumb in every battle.

IV. TACTICAL DISPOSITIONS - 軍形

Abstract Sun Tzu explains in an abstract and poetic way what a great leader should do to maximize his chance for success in a war.

Mi Heng hitting the drum and abusing Cao Cao.

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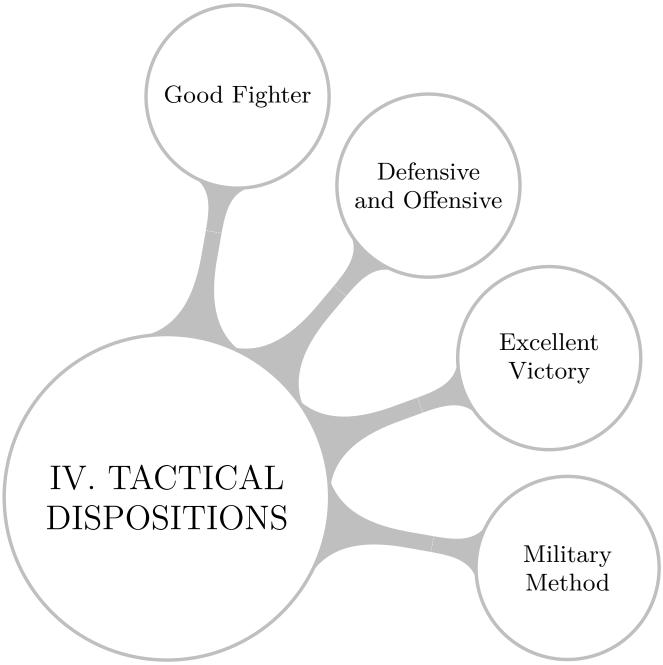
P. van Emde Boas et al., *Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps*, Logic in Asia: Studia Logica Library,
https://doi.org/10.1007/978-981-19-6250-9_14

Main Concepts


Good Fighter
Defensive and Offensive
Excellent Victory
IV. TACTICAL DISPOSITIONS
Military Method

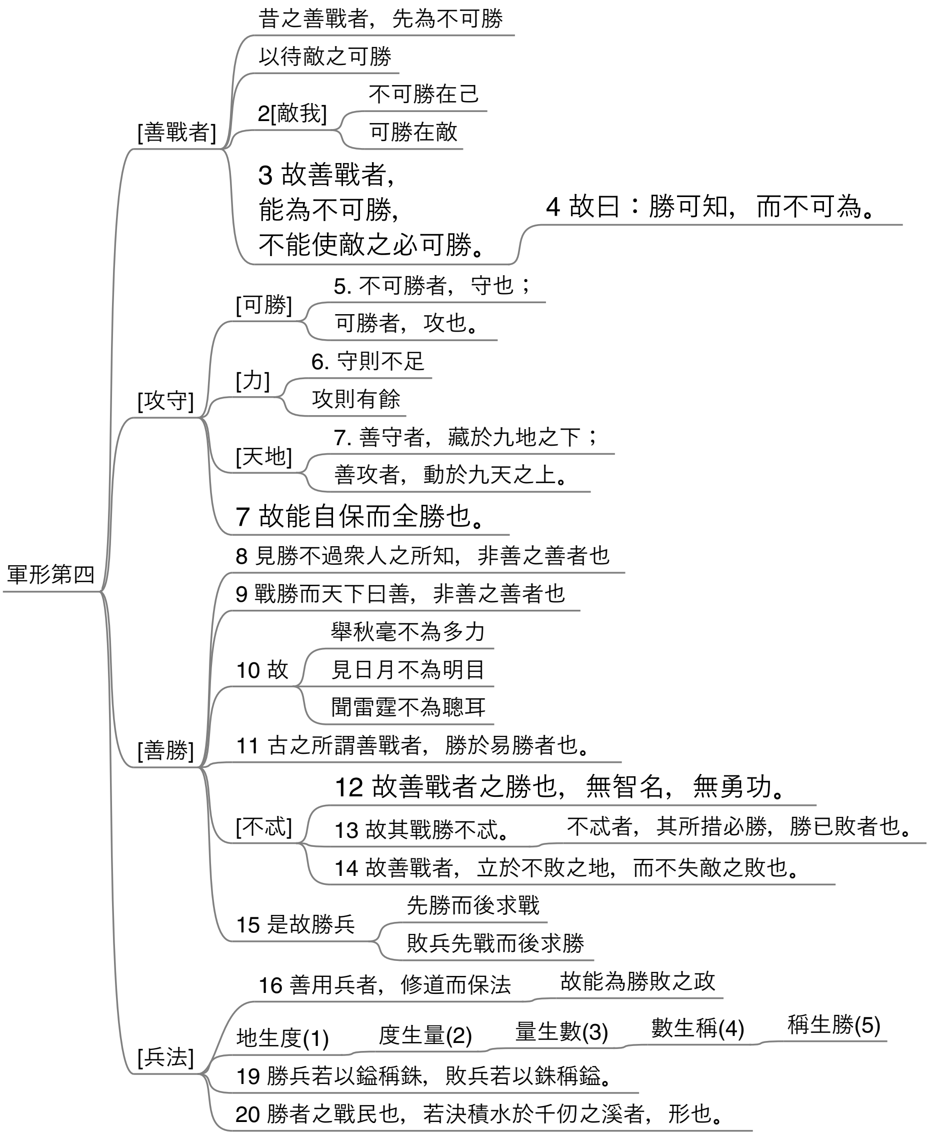
Overview of the Contents

The content can best be summarized with the following quote from paragraphs 17-19:

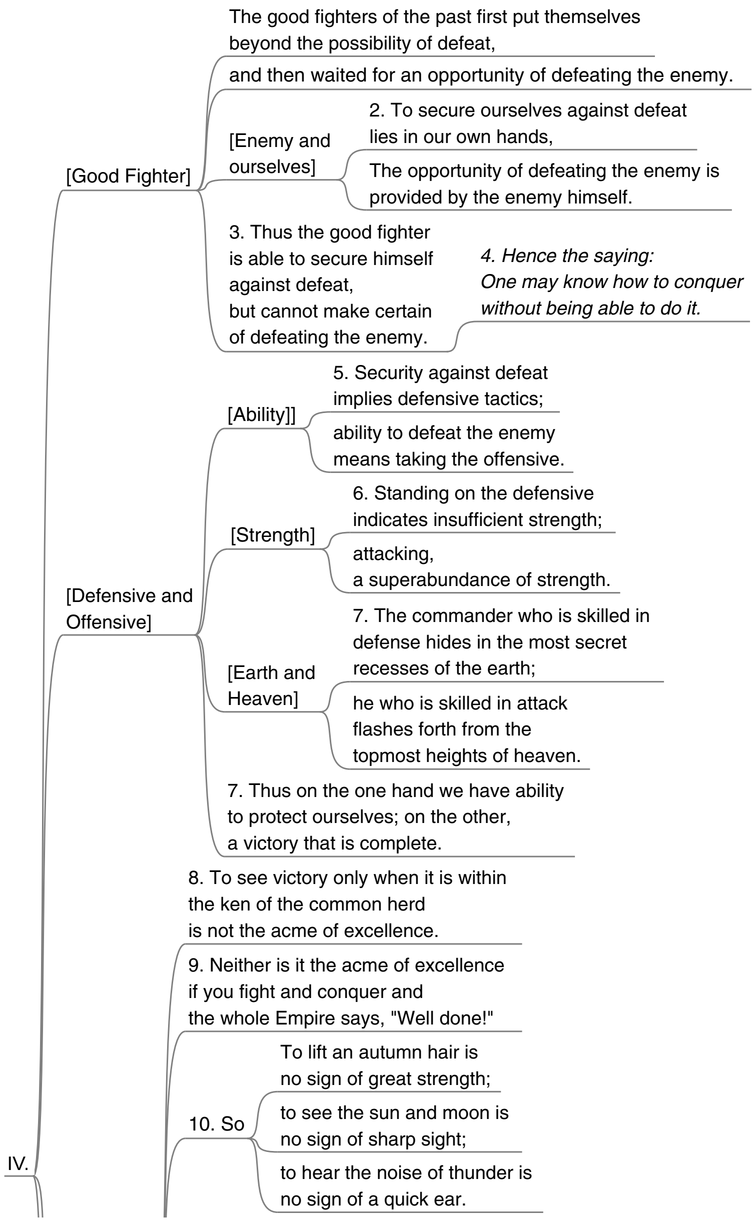
```
16. The consummate leader cultivates the moral law, and
strictly adheres to method and discipline;
  » thus it is in his power to control success.
Earth determines:
  » (1) Analysis, determines:
    ° (2) Estimation of quantity,determines:
      - (3) Calculation,determines:
        - (4) Balancing of chances, determines:
         - (5), Victory.
19. So, a victorious army as opposed to a loosing one,
is as a pound's weight placed in the scale against a
single grain.
```

The Mind Maps

The overview for this chapter can be found in mind map figures 16 to 18.

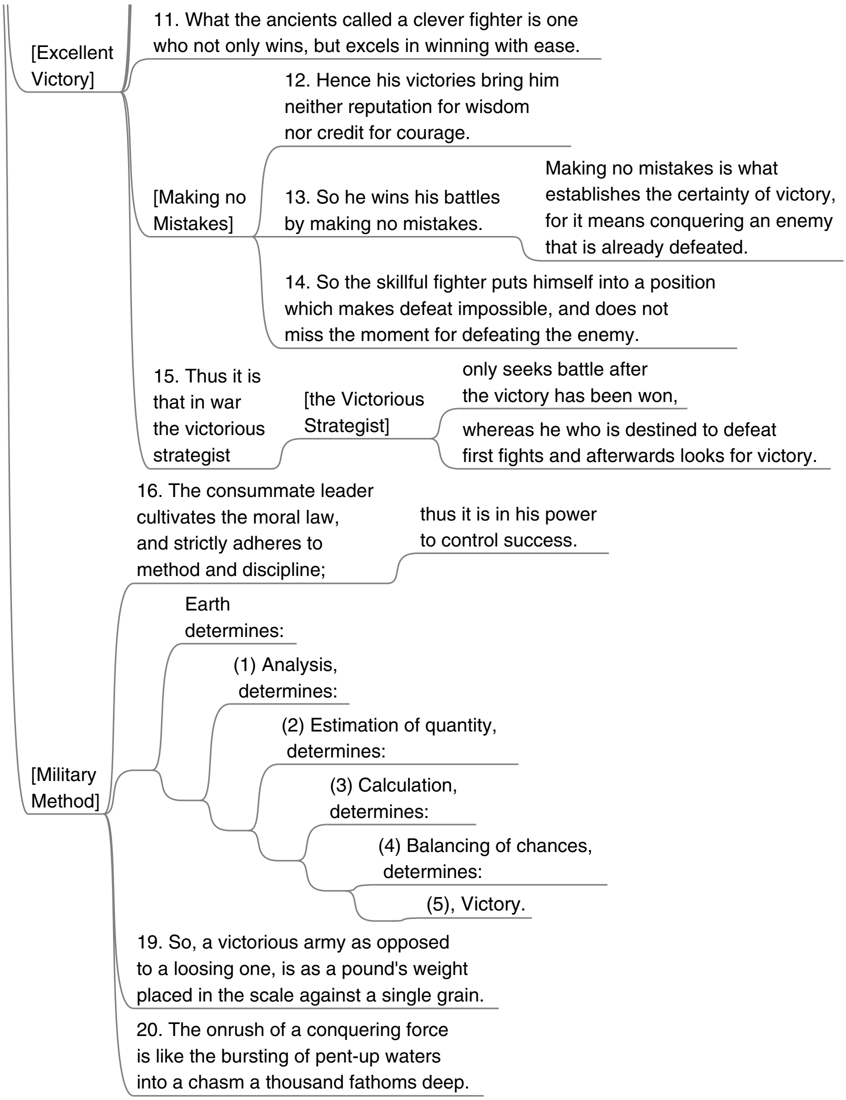

軍形第四
[善戰者]
昔之善戰者，先為不可勝
以待敵之可勝
2[敵我]
不可勝在己
可勝在敵
3 故善戰者，
能為不可勝，
不能使敵之必可勝。
4 故曰：勝可知，而不可為。
[攻守]
[可勝]
5. 不可勝者，守也；
可勝者，攻也。
[力]
6. 守則不足
攻則有餘
[天地]
7. 善守者，藏於九地之下；
善攻者，動於九天之上。
7 故能自保而全勝也。
[善勝]
8 見勝不過衆人之所知，非善之善者也
9 戰勝而天下曰善，非善之善者也
10 故
舉秋毫不為多力
見日月不為明目
聞雷霆不為聰耳
11 古之所謂善戰者，勝於易勝者也。
[不忒]
12 故善戰者之勝也，無智名，無勇功。
13 故其戰勝不忒。
不忒者，其所措必勝，勝已敗者也。
14 故善戰者，立於不敗之地，而不失敵之敗也。
15 是故勝兵
先勝而後求戰
敗兵先戰而後求勝
[兵法]
16 善用兵者，修道而保法
故能為勝敗之政
地生度(1)
度生量(2)
量生數(3)
數生稱(4)
稱生勝(5)
19 勝兵若以鎰稱銖，敗兵若以銖稱鎰。
20 勝者之戰民也，若決積水於千仞之溪者，形也。

Mind Map 16: AoW Chapter IV - the Chinese Mind Map



- IV.
  - [Good Fighter]
    - The good fighters of the past first put themselves beyond the possibility of defeat,
    - and then waited for an opportunity of defeating the enemy.
    - [Enemy and ourselves]
      - 2. To secure ourselves against defeat lies in our own hands,
      - The opportunity of defeating the enemy is provided by the enemy himself.
    - 3. Thus the good fighter is able to secure himself against defeat, but cannot make certain of defeating the enemy.
      - *4. Hence the saying: One may know how to conquer without being able to do it.*
  - [Defensive and Offensive]
    - [Ability]]
      - 5. Security against defeat implies defensive tactics;
      - ability to defeat the enemy means taking the offensive.
    - [Strength]
      - 6. Standing on the defensive indicates insufficient strength;
      - attacking, a superabundance of strength.
    - [Earth and Heaven]
      - 7. The commander who is skilled in defense hides in the most secret recesses of the earth;
      - he who is skilled in attack flashes forth from the topmost heights of heaven.
    - 7. Thus on the one hand we have ability to protect ourselves; on the other, a victory that is complete.
  - 8. To see victory only when it is within the ken of the common herd is not the acme of excellence.
  - 9. Neither is it the acme of excellence if you fight and conquer and the whole Empire says, "Well done!"
  - 10. So
    - To lift an autumn hair is no sign of great strength;
    - to see the sun and moon is no sign of sharp sight;
    - to hear the noise of thunder is no sign of a quick ear.

Mind Map 17: AoW Chapter IV - TACTICAL DISPOSITIONS - Part 1



11. What the ancients called a clever fighter is one who not only wins, but excels in winning with ease.

12. Hence his victories bring him neither reputation for wisdom nor credit for courage.

13. So he wins his battles by making no mistakes.

Making no mistakes is what establishes the certainty of victory, for it means conquering an enemy that is already defeated.

14. So the skillful fighter puts himself into a position which makes defeat impossible, and does not miss the moment for defeating the enemy.

15. Thus it is that in war the victorious strategist

only seeks battle after the victory has been won,

whereas he who is destined to defeat first fights and afterwards looks for victory.

16. The consummate leader cultivates the moral law, and strictly adheres to method and discipline;

thus it is in his power to control success.

Earth determines:

(1) Analysis, determines:

(2) Estimation of quantity, determines:

(3) Calculation, determines:

(4) Balancing of chances, determines:

(5), Victory.

19. So, a victorious army as opposed to a loosing one, is as a pound's weight placed in the scale against a single grain.

20. The onrush of a conquering force is like the bursting of pent-up waters into a chasm a thousand fathoms deep.

Mind Map 18: AoW Chapter IV - TACTICAL DISPOSITIONS - Part 2

Details and Patterns

This chapter is again full of reasoning: the character 故 (gù), indicating the start of a conclusion, appears 10 times.

Good Fighter

Sun Tzu explains that, although it may be impossible to be defeated, it can also be impossible to conquer the enemy, because his opponent is an equally good fighter.

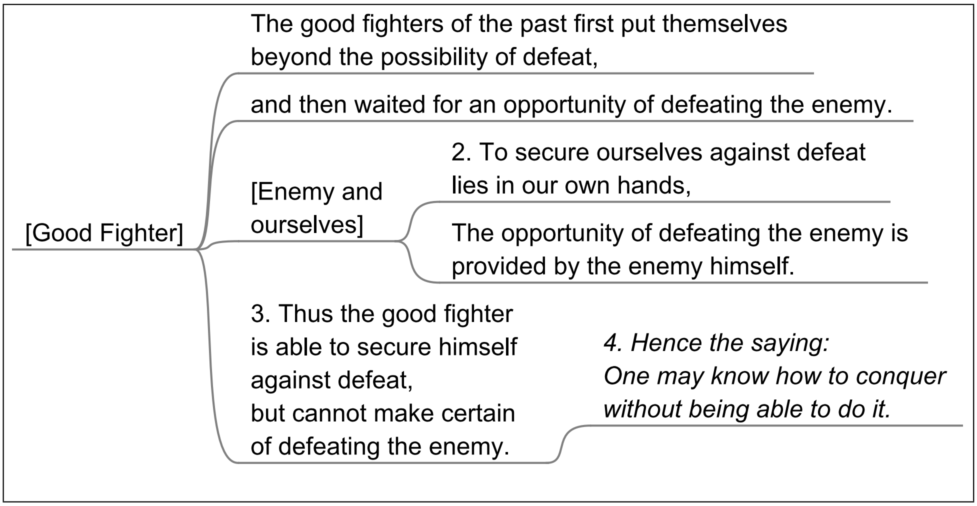

[Good Fighter]
The good fighters of the past first put themselves beyond the possibility of defeat,
and then waited for an opportunity of defeating the enemy.
[Enemy and ourselves]
2. To secure ourselves against defeat lies in our own hands,
The opportunity of defeating the enemy is provided by the enemy himself.
3. Thus the good fighter is able to secure himself against defeat, but cannot make certain of defeating the enemy.
4. Hence the saying: One may know how to conquer without being able to do it.

Fig. 48: Good Fighter

- **Conditional Sentences**
  - Par. 3: `=> Judge. (故)`.
  - Par. 4: `=> Judge. (故)`.

Defensive and Offensive

Here, we find two *metaphors*, which together are a *pair of opposites*:

- **Metaphors**
  - Par. 7: The general who is skilled in defense hides in the most *secret recesses of the earth*; he who is skilled in attack flashes forth from the topmost *heights of heaven*.
- **Pair of Opposites**
  - Par. 7: *secret recesses of the earth* and *heights of heaven*.

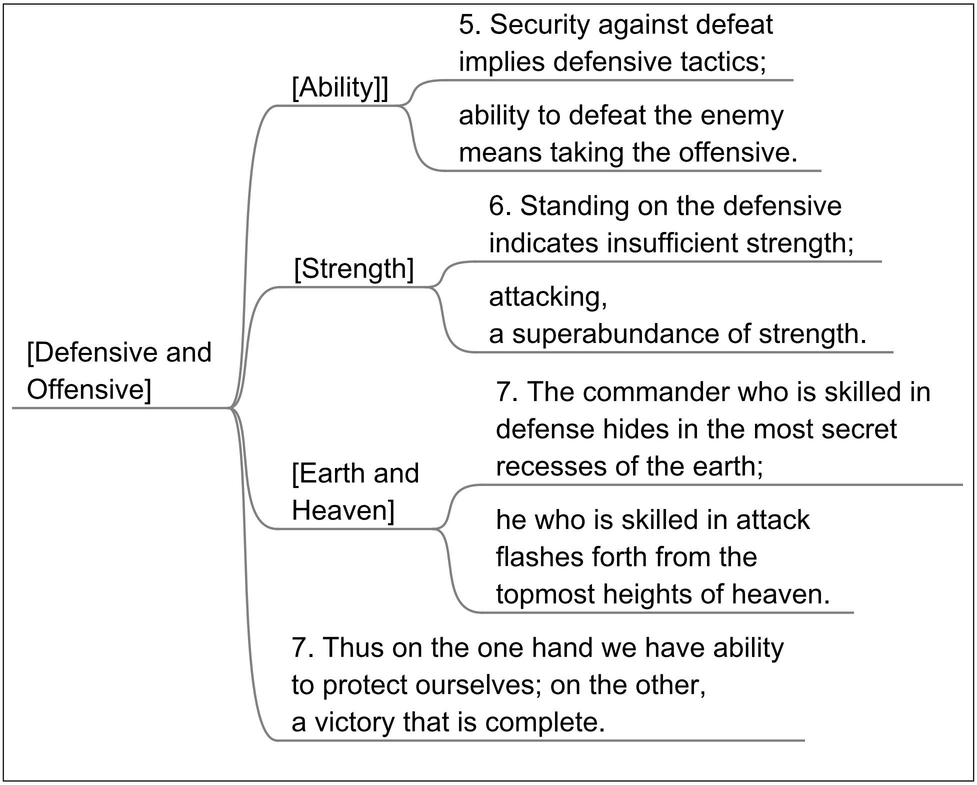

[Defensive and Offensive]
[Ability]]
5. Security against defeat implies defensive tactics;
ability to defeat the enemy means taking the offensive.
[Strength]
6. Standing on the defensive indicates insufficient strength;
attacking, a superabundance of strength.
[Earth and Heaven]
7. The commander who is skilled in defense hides in the most secret recesses of the earth;
he who is skilled in attack flashes forth from the topmost heights of heaven.
7. Thus on the one hand we have ability to protect ourselves; on the other, a victory that is complete.

Fig. 49: Defensive and Offensive

- **Conditional Sentences**
  - Par. 5: `2(Cond. => Conseq.)`. Backtracking indication by 也.
  - Par. 6: `2(Cond. => Cond)`.
  - Par. 7: `Judge. => Judge. (故)`.

Excellent Victory

The mind map fragment in figure 50 contains a small round circles indicating parts are collapsed. These details can be found in figure 52.

There are a number of metaphors in this section:

10. To lift an autumn hair is no sign of great strength; to see the sun and moon is no sign of sharp sight; to hear the noise of thunder is no sign of a quick ear.

- **Conditional Sentences**
  - Par. 10: `=> 3 Judge. (故)`.
  - Par. 12: `Judge. (故)`. 也 indicates the essence of the statement.
  - Par. 13: `(Cond. => Conseq.) (故)`.

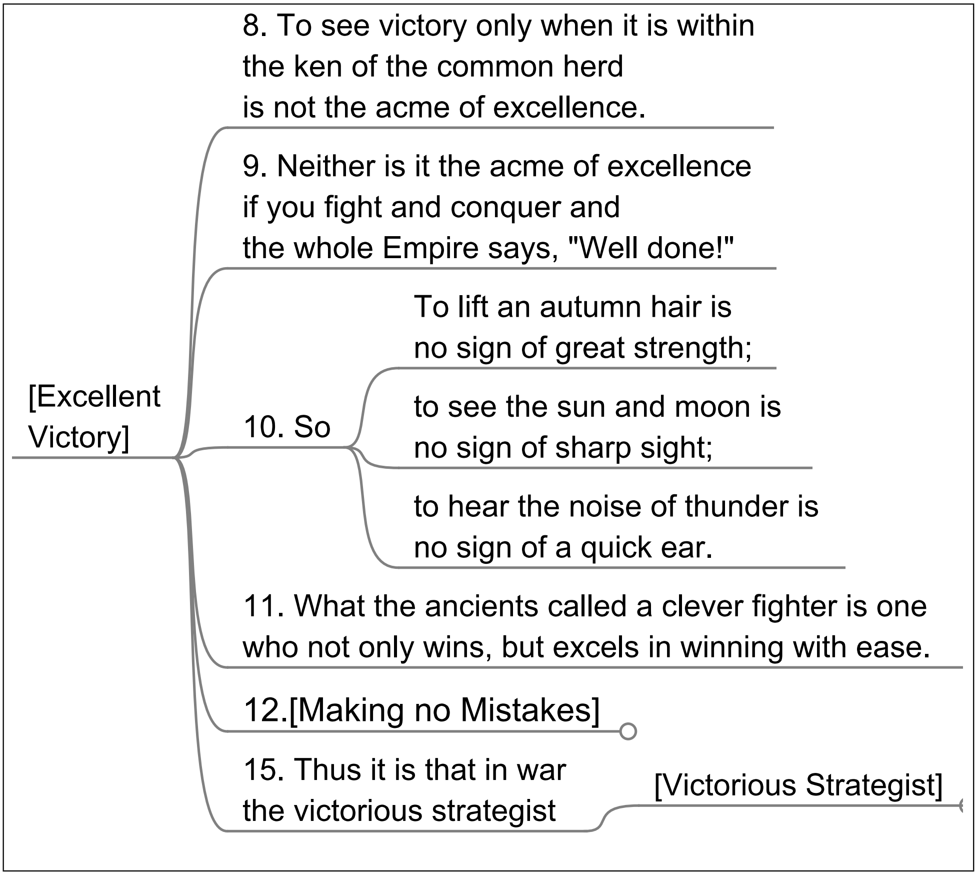

[Excellent Victory]
8. To see victory only when it is within the ken of the common herd is not the acme of excellence.
9. Neither is it the acme of excellence if you fight and conquer and the whole Empire says, "Well done!"
10. So
To lift an autumn hair is no sign of great strength;
to see the sun and moon is no sign of sharp sight;
to hear the noise of thunder is no sign of a quick ear.
11. What the ancients called a clever fighter is one who not only wins, but excels in winning with ease.
12.[Making no Mistakes]
15. Thus it is that in war the victorious strategist
[Victorious Strategist]

Fig. 50: Excellent Victory

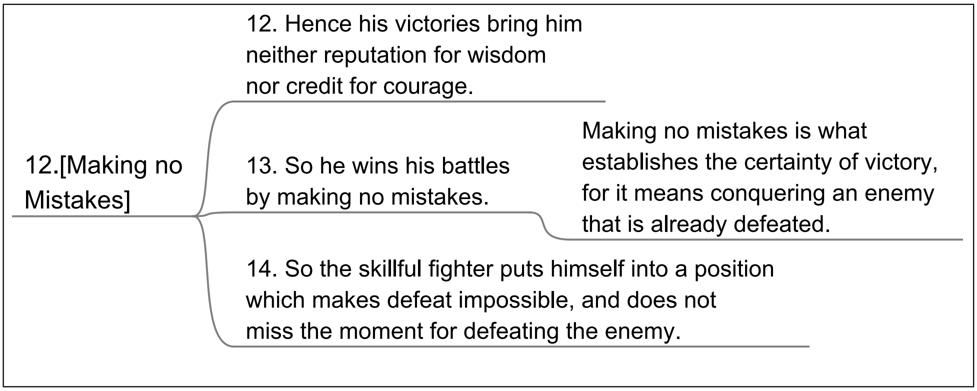

12.[Making no Mistakes]
12. Hence his victories bring him neither reputation for wisdom nor credit for courage.
13. So he wins his battles by making no mistakes.
Making no mistakes is what establishes the certainty of victory, for it means conquering an enemy that is already defeated.
14. So the skillful fighter puts himself into a position which makes defeat impossible, and does not miss the moment for defeating the enemy.

Fig. 51: Excellent Victory - Making no Mistakes

- Par. 14: `=> Judge. (故)`.
- Par. 15: `2(Cond. => Conseq.)`, if-then-else construction, (故).

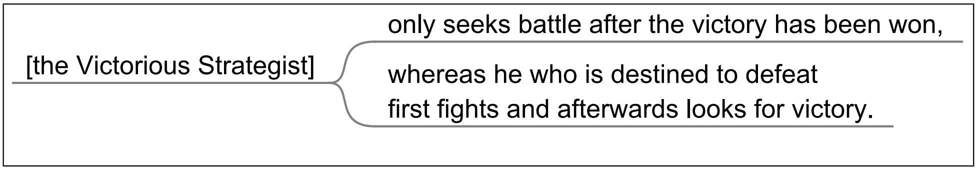

[the Victorious Strategist]
only seeks battle after the victory has been won,
whereas he who is destined to defeat
first fights and afterwards looks for victory.

Fig. 52: Excellent Victory - Victorious Strategist

Military Method

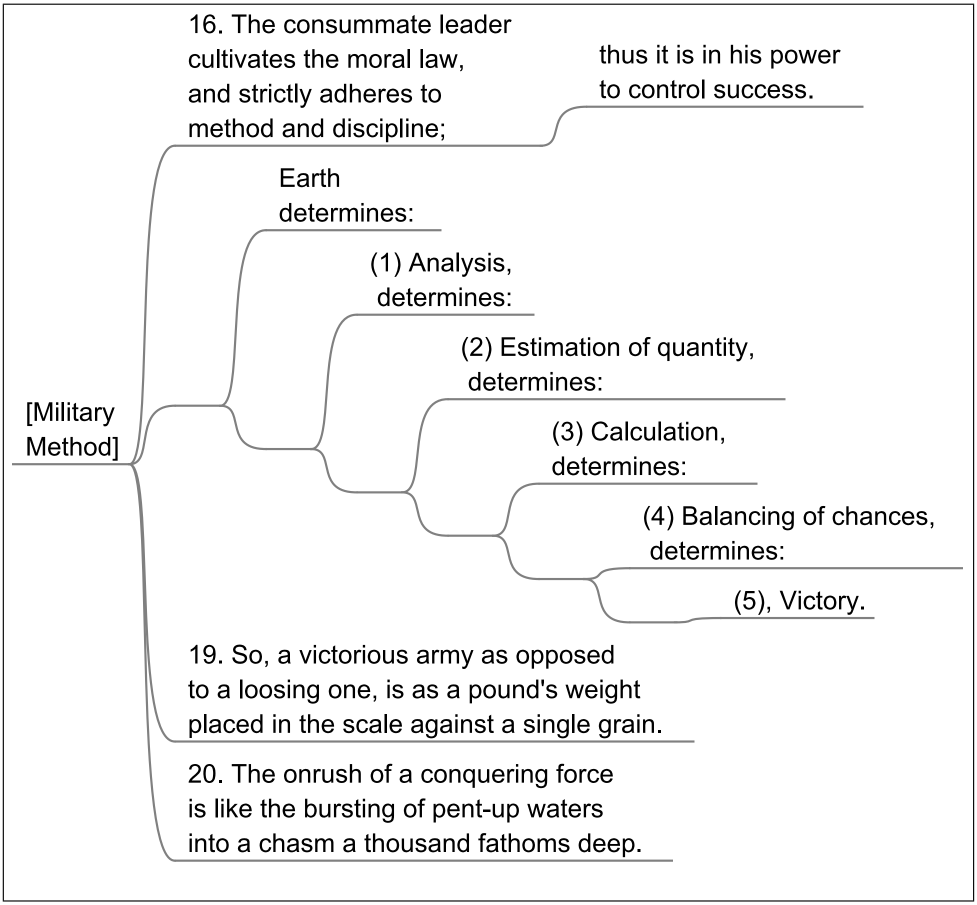

[Military Method]
16. The consummate leader cultivates the moral law, and strictly adheres to method and discipline;
thus it is in his power to control success.
Earth determines:
(1) Analysis, determines:
(2) Estimation of quantity, determines:
(3) Calculation, determines:
(4) Balancing of chances, determines:
(5), Victory.
19. So, a victorious army as opposed to a loosing one, is as a pound's weight placed in the scale against a single grain.
20. The onrush of a conquering force is like the bursting of pent-up waters into a chasm a thousand fathoms deep.

Fig. 53: Military Method

We see several *metaphors* here:
19. A victorious army opposed to a routed one, is as a *pound's weight placed in the scale against a single grain.*
20. The onrush of a conquering force is like *the bursting of pent-up waters into a chasm a thousand fathoms deep.*

The original English text of the *5 Factors for Military Method* reads like this:

```
17. In respect of military method, we have,
    firstly, Measurement;
    secondly, Estimation of quantity;
    thirdly, Calculation;
    fourthly, Balancing of chances;
    fifthly, Victory.
18. Measurement owes its existence to Earth;
    Estimation of quantity to Measurement;
    Calculation to Estimation of quantity;
    Balancing of chances to Calculation;
    and Victory to Balancing of chances.
```

This enumeration posed an interesting problem of putting it in a mind map. Most translations refer to the previous enumerated item backwards: *Analysis is determined by Earth*, and so on.

However, this does not look good in a mind map and more careful study of the Chinese text leads us to believe that forward reference is much better and more true to the original text.

Therefore, we reconstructed the text as: *Earth determines: Analysis, determines: Estimation of quantity, determines*, and so on. This is reflected both the Chinese and the English mind map details in figures 54 and 55. As you can see, this mind map detail does not look good on paper, because it is too wide. Therefore the larger mind map detail in figure 53 has been modified to make it readable.

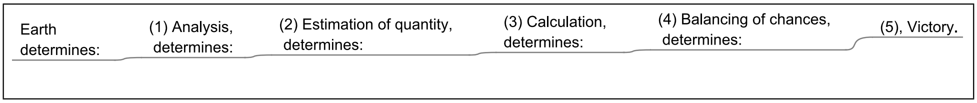

Earth determines:
(1) Analysis, determines:
(2) Estimation of quantity, determines:
(3) Calculation, determines:
(4) Balancing of chances, determines:
(5), Victory.

Fig. 54: Enumerations of Methods

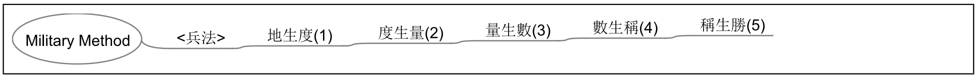

Military Method
<兵法>
地生度(1)
度生量(2)
量生數(3)
數生稱(4)
稱生勝(5)

Fig. 55: Military Method

- **Conditional Sentences**
  - Par. 16: `2 Adv. => Conseq. (故)`.
  - Par. 17-18: `5(adv. => Adv.)`. Enumeration followed by five reversed causal relations.
  - Par. 19-20: `Judge. (故)`, The judgement is a metaphor.

Structured Text

IV. TACTICAL DISPOSITIONS

- **Good Fighter**

  The good fighters of the past first put themselves beyond the possibility of defeat,
  and then waited for an opportunity of defeating the enemy.
  2.[Enemy and Ourselves]
  - To secure ourselves against defeat lies in our own hands,
  - The opportunity of defeating the enemy is provided by the enemy himself.

  3. Thus the good fighter is able to secure himself against defeat, but cannot make certain of defeating the enemy.
  - 4. Hence the saying: One may know how to conquer without being able to do it.

- **Defensive and Offensive**

  [Ability]
  - 5. Security against defeat implies defensive tactics;
  - ability to defeat the enemy means taking the offensive.

  [Strength]
  - 6. Standing on the defensive indicates insufficient strength;
  - attacking, a superabundance of strength.

  [Earth and Heaven]
  - 7. The commander who is skilled in defense hides in the most secret recesses of the earth;
  - he who is skilled in attack flashes forth from the topmost heights of heaven.

  7. Thus on the one hand we have ability to protect ourselves; on the other, a victory that is complete.

- **Excellent Victory**

  8. To see victory only when it is within the ken of the common herd is not the acme of excellence.
  9. Neither is it the acme of excellence if you fight and conquer and the whole Empire says, Well done!
  10. So
  - To lift an autumn hair is no sign of great strength;
  - to see the sun and moon is no sign of sharp sight;
  - to hear the noise of thunder is no sign of a quick ear.

  11. What the ancients called a clever fighter is one who not only wins, but excels in winning with ease.
  12.[Making no mistakes]
  - 12. Hence his victories bring him neither

reputation for wisdom nor credit for courage.

- 13. So he wins his battles by making no mistakes.
  - Making no mistakes is what establishes the certainty of victory, for it means conquering an enemy that is already defeated.
- 14. So the skillful fighter puts himself into a position which makes defeat impossible, and does not miss the moment for defeating the enemy.

15. Thus it is that in war

- the victorious strategist only seeks battle after the victory has been won,
- whereas he who is destined to defeat first fights and afterwards looks for victory.

- **Military Method**

16. The consummate leader cultivates the moral law, and strictly adheres to method and discipline;

- thus it is in his power to control success.

Earth determines:

- (1) Analysis, determines:
  - (2) Estimation of quantity,determines:
    - (3) Calculation,determines:
      - (4) Balancing of chances, determines:
        - (5), Victory.

19. So, a victorious army as opposed to a loosing one, is as a pound's weight placed in the scale against a single grain.

20. The onrush of a conquering force is like the bursting of pent-up waters into a chasm a thousand fathoms deep.

V. ENERGY - 兵勢

Abstract Sun Tzu speaks here about combinations and variations: The control of a large force is the same principle as the control of a few men: it is merely a question of dividing up their numbers. And: In battle, there are not more than two methods of attack the direct and the indirect; yet these two in combination give rise to an endless series of maneuvers.

Zhang Fei fighting Ma Chao at night.

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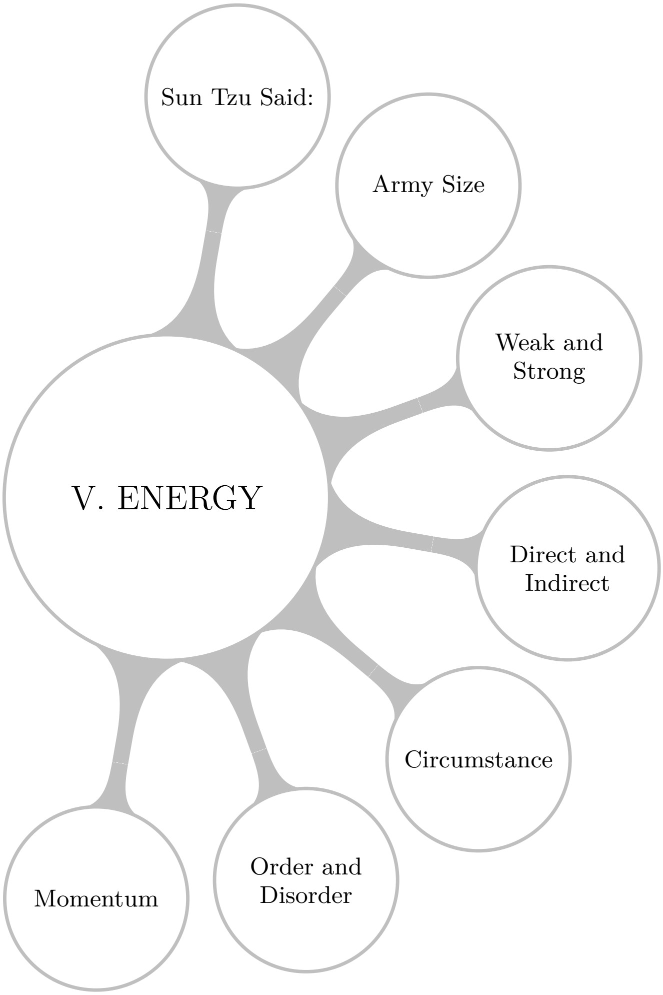
P. van Emde Boas et al., *Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps*, Logic in Asia: Studia Logica Library,
https://doi.org/10.1007/978-981-19-6250-9_15

Main Concepts

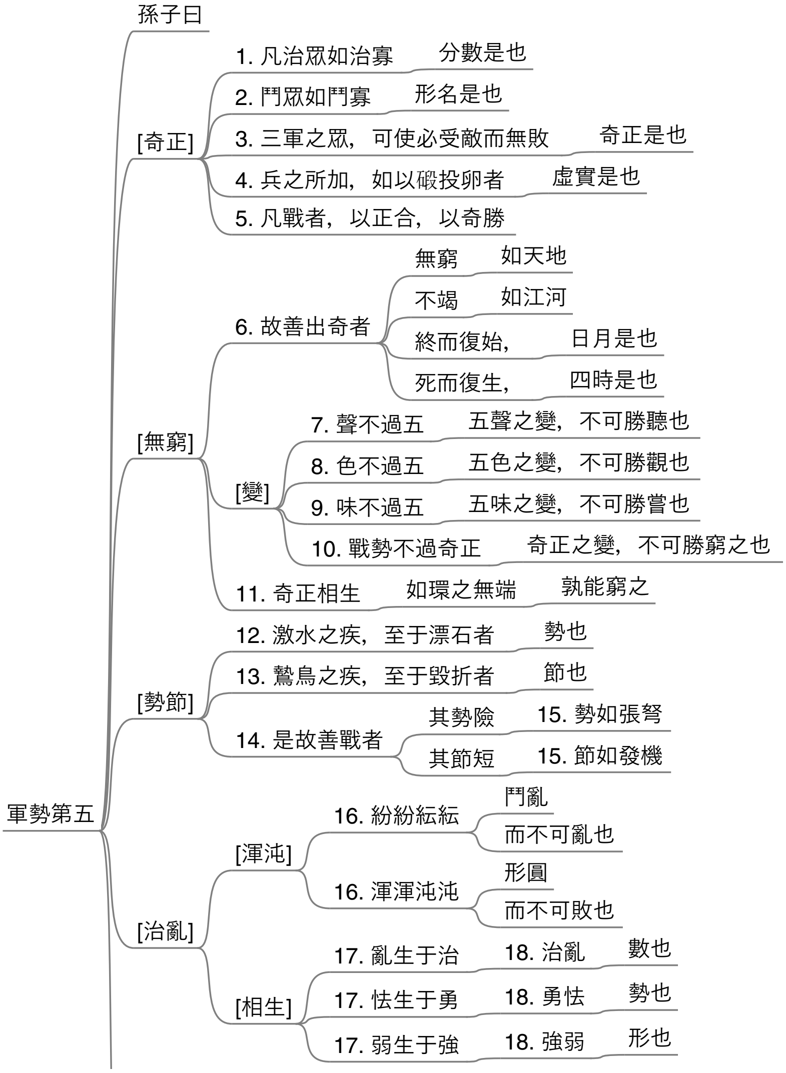

Sun Tzu Said:
Army Size
Weak and Strong
V. ENERGY
Direct and Indirect
Circumstance
Momentum
Order and Disorder

Overview of the Contents

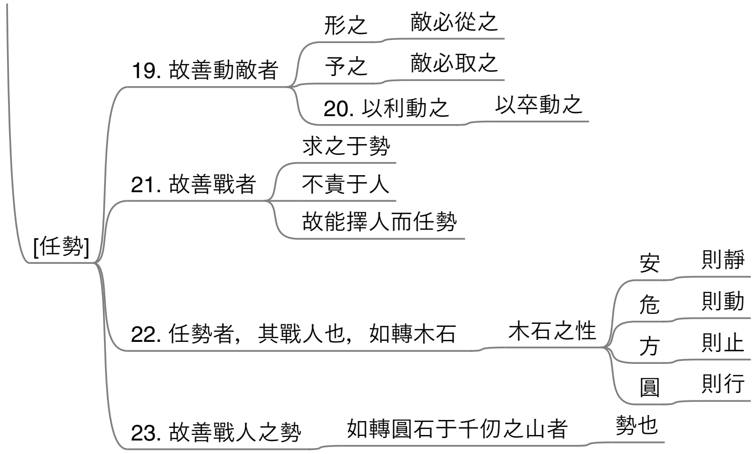
AoW chapter V is a rather philosophical chapter that we have covered in more detail in the chapter where we describe how interesting text can be found, see: The Making of a Mind Map, on page 33.

Mind Maps

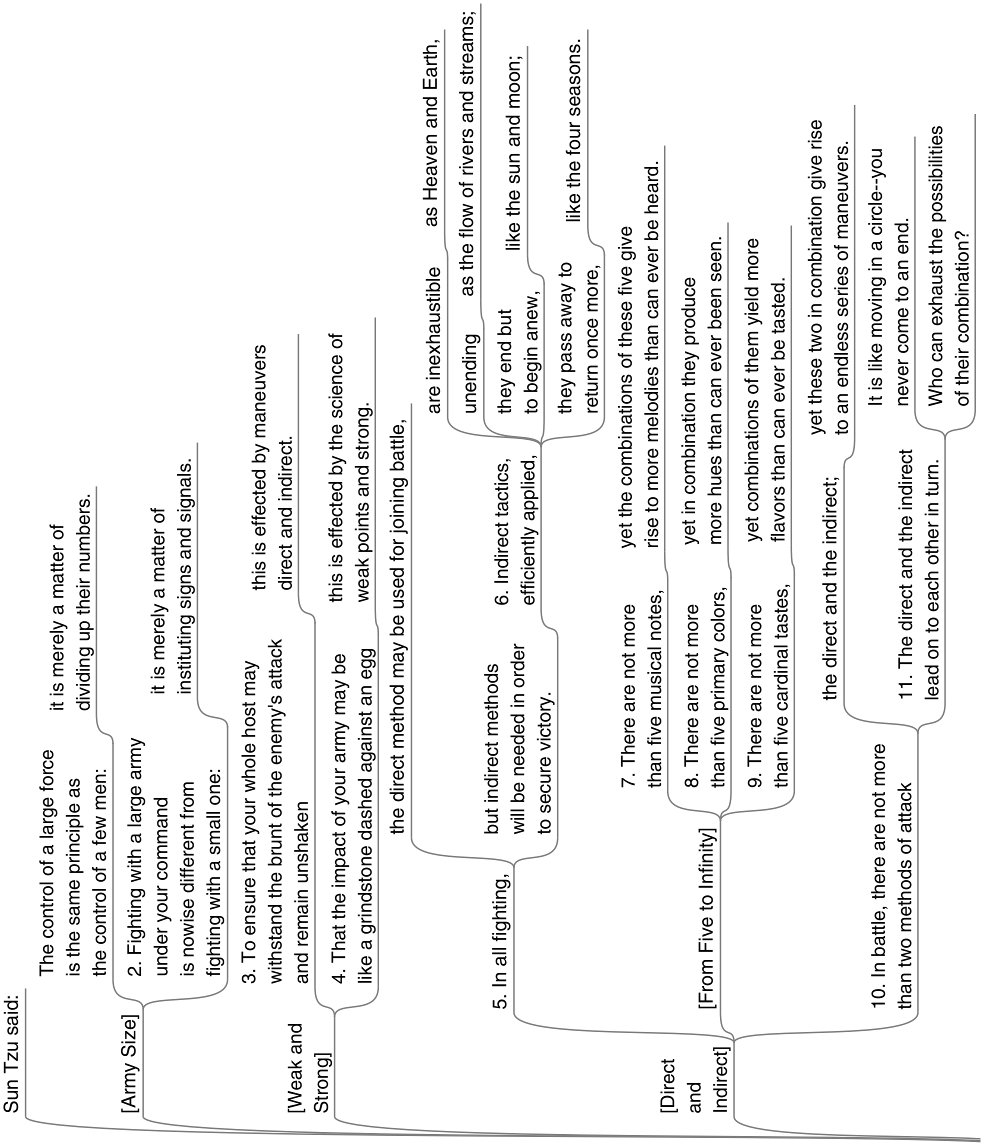
The overview for this chapter can be found in mind map figures 19 to 22.


軍勢第五
孫子曰
[奇正]
1. 凡治眾如治寡
分數是也
2. 鬥眾如鬥寡
形名是也
3. 三軍之眾，可使必受敵而無敗
奇正是也
4. 兵之所加，如以碫投卵者
虛實是也
5. 凡戰者，以正合，以奇勝
[無窮]
6. 故善出奇者
無窮
如天地
不竭
如江河
終而復始，
日月是也
死而復生，
四時是也
[變]
7. 聲不過五
五聲之變，不可勝聽也
8. 色不過五
五色之變，不可勝觀也
9. 味不過五
五味之變，不可勝嘗也
10. 戰勢不過奇正
奇正之變，不可勝窮之也
11. 奇正相生
如環之無端
孰能窮之
[勢節]
12. 激水之疾，至于漂石者
勢也
13. 鷙鳥之疾，至于毀折者
節也
14. 是故善戰者
其勢險
15. 勢如張弩
其節短
15. 節如發機
[治亂]
[渾沌]
16. 紛紛紜紜
鬥亂
而不可亂也
16. 渾渾沌沌
形圓
而不可敗也
[相生]
17. 亂生于治
18. 治亂
數也
17. 怯生于勇
18. 勇怯
勢也
17. 弱生于強
18. 強弱
形也

Mind Map 19: Aow Ch. V - Chinese Mind Map - Part 1

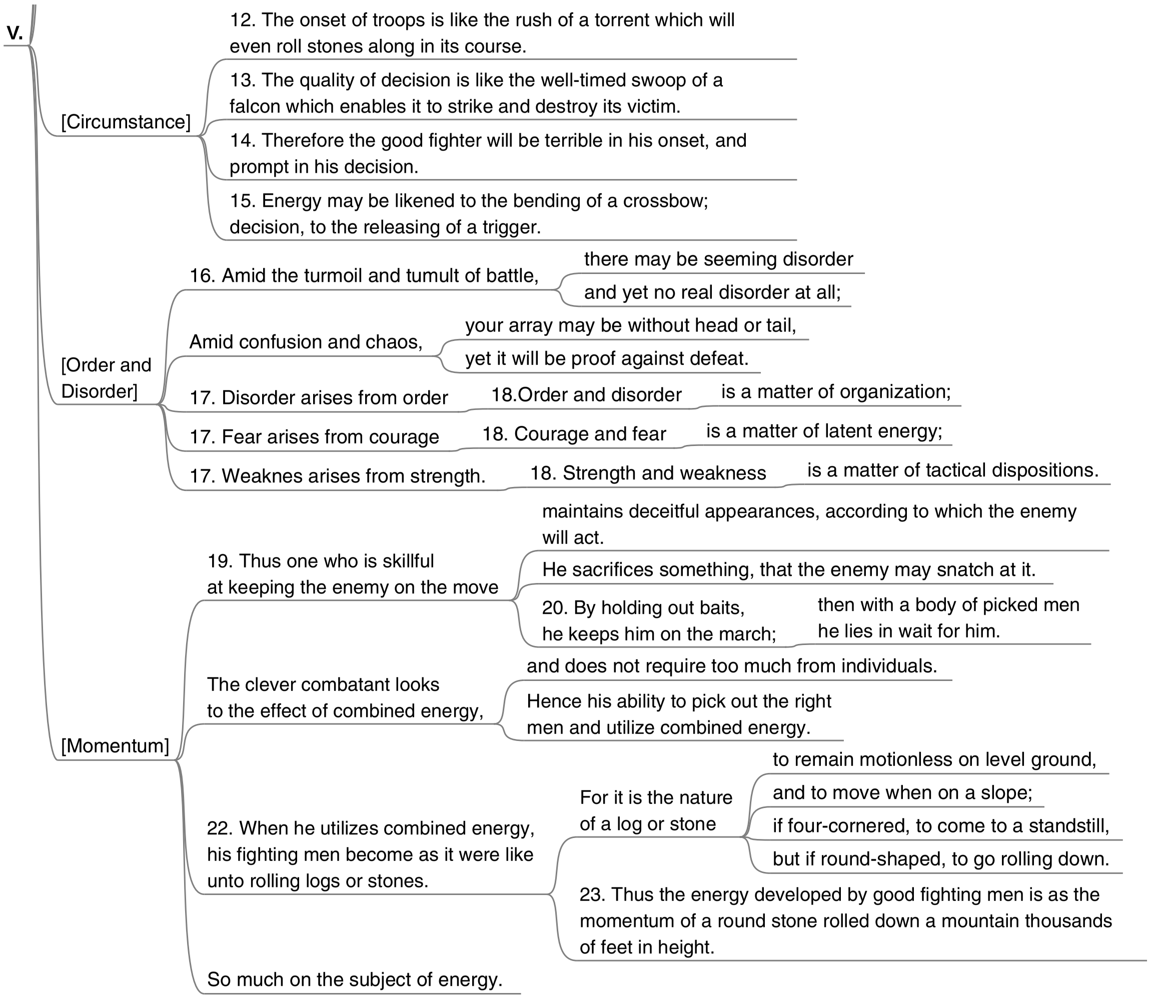

[任勢]
19. 故善動敵者
形之
敵必從之
予之
敵必取之
20. 以利動之
以卒動之
21. 故善戰者
求之于勢
不責于人
故能擇人而任勢
22. 任勢者，其戰人也，如轉木石
木石之性
安
則靜
危
則動
方
則止
圓
則行
23. 故善戰人之勢
如轉圓石于千仞之山者
勢也

Mind Map 20: Aow Ch. V - Chinese Mind Map - Part 2



- Sun Tzu said:
  - The control of a large force is the same principle as the control of a few men:
    - it is merely a matter of dividing up their numbers.
- [Army Size]
  - 2. Fighting with a large army under your command is nowise different from fighting with a small one:
    - it is merely a matter of instituting signs and signals.
- [Weak and Strong]
  - 3. To ensure that your whole host may withstand the brunt of the enemy's attack and remain unshaken
    - this is effected by maneuvers direct and indirect.
  - 4. That the impact of your army may be like a grindstone dashed against an egg
    - this is effected by the science of weak points and strong.
- [Direct and Indirect]
  - 5. In all fighting,
    - the direct method may be used for joining battle,
    - but indirect methods will be needed in order to secure victory.
      - 6. Indirect tactics, efficiently applied,
        - are inexhaustible
          - as Heaven and Earth,
        - unending
          - as the flow of rivers and streams;
        - they end but to begin anew,
          - like the sun and moon;
        - they pass away to return once more,
          - like the four seasons.
  - [From Five to Infinity]
    - 7. There are not more than five musical notes,
      - yet the combinations of these five give rise to more melodies than can ever be heard.
    - 8. There are not more than five primary colors,
      - yet in combination they produce more hues than can ever been seen.
    - 9. There are not more than five cardinal tastes,
      - yet combinations of them yield more flavors than can ever be tasted.
  - 10. In battle, there are not more than two methods of attack
    - the direct and the indirect;
      - yet these two in combination give rise to an endless series of maneuvers.
    - 11. The direct and the indirect lead on to each other in turn.
      - It is like moving in a circle--you never come to an end.
      - Who can exhaust the possibilities of their combination?

Mind Map 21: Aow Ch. V, ENERGY - the English Mind Map - Part 1



- **V.**
  - [Circumstance]
    - 12. The onset of troops is like the rush of a torrent which will even roll stones along in its course.
    - 13. The quality of decision is like the well-timed swoop of a falcon which enables it to strike and destroy its victim.
    - 14. Therefore the good fighter will be terrible in his onset, and prompt in his decision.
    - 15. Energy may be likened to the bending of a crossbow; decision, to the releasing of a trigger.
  - [Order and Disorder]
    - 16. Amid the turmoil and tumult of battle,
      - there may be seeming disorder
      - and yet no real disorder at all;
    - Amid confusion and chaos,
      - your array may be without head or tail,
      - yet it will be proof against defeat.
    - 17. Disorder arises from order
      - 18.Order and disorder
        - is a matter of organization;
    - 17. Fear arises from courage
      - 18. Courage and fear
        - is a matter of latent energy;
    - 17. Weaknes arises from strength.
      - 18. Strength and weakness
        - is a matter of tactical dispositions.
  - [Momentum]
    - 19. Thus one who is skillful at keeping the enemy on the move
      - maintains deceitful appearances, according to which the enemy will act.
      - He sacrifices something, that the enemy may snatch at it.
      - 20. By holding out baits, he keeps him on the march;
        - then with a body of picked men he lies in wait for him.
    - The clever combatant looks to the effect of combined energy,
      - and does not require too much from individuals.
      - Hence his ability to pick out the right men and utilize combined energy.
    - 22. When he utilizes combined energy, his fighting men become as it were like unto rolling logs or stones.
      - For it is the nature of a log or stone
        - to remain motionless on level ground,
        - and to move when on a slope;
        - if four-cornered, to come to a standstill,
        - but if round-shaped, to go rolling down.
      - 23. Thus the energy developed by good fighting men is as the momentum of a round stone rolled down a mountain thousands of feet in height.
    - So much on the subject of energy.

Mind Map 22: Aow Ch. V, ENERGY - the English Mind Map - Part 2

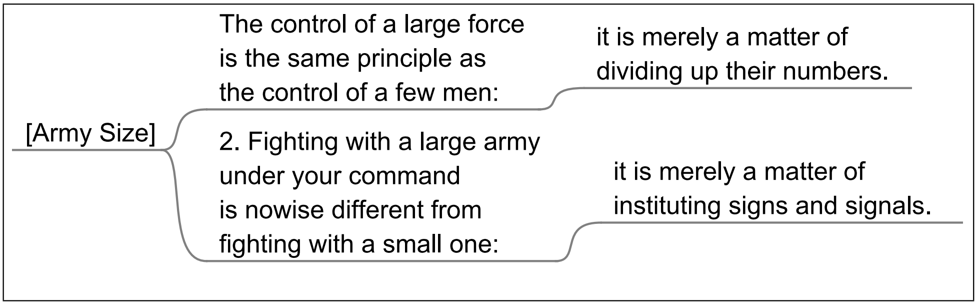
Details and Patterns

Sun Tzu Said:

As always, the first text in a chapter is *Sun Tzu Said*. This chapter handles division, to obtain manageable parts, and combination, to obtain endless possibilities. It also talks about awaiting the right moment with the right means for action, with such force that it is irresistible.

Army Size

A large army can be split into small parts and managing it effectively depends on *instituting signs and signals*, or in modern terms, using effective communication.



[Army Size]

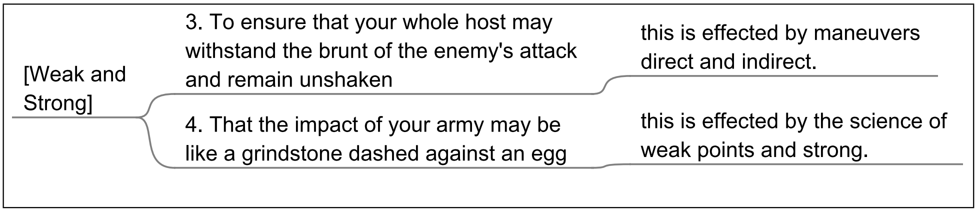
The control of a large force is the same principle as the control of a few men: it is merely a matter of dividing up their numbers.

2. Fighting with a large army under your command is nowise different from fighting with a small one: it is merely a matter of instituting signs and signals.

Fig. 56: Army Size

Weak and Strong

As the title of this subject suggests, we see a *pair of opposites* pattern: weak and strong.



[Weak and Strong]

3. To ensure that your whole host may withstand the brunt of the enemy's attack and remain unshaken this is effected by maneuvers direct and indirect.

4. That the impact of your army may be like a grindstone dashed against an egg this is effected by the science of weak points and strong.

Fig. 57: Weak and Strong

A *metaphor* pattern is found in par. 4: That the impact of your army may be like a *grindstone* dashed against an egg.

Direct and Indirect

This topic consists of three parts: *direct and indirect methods*, the *from five to infinity* reasoning, and the reasoning about *combinations* of direct and indirect methods. See figure 58, for an overview. The details, to be inserted at the small open circles, can be found in figures 61, 62, and 63.

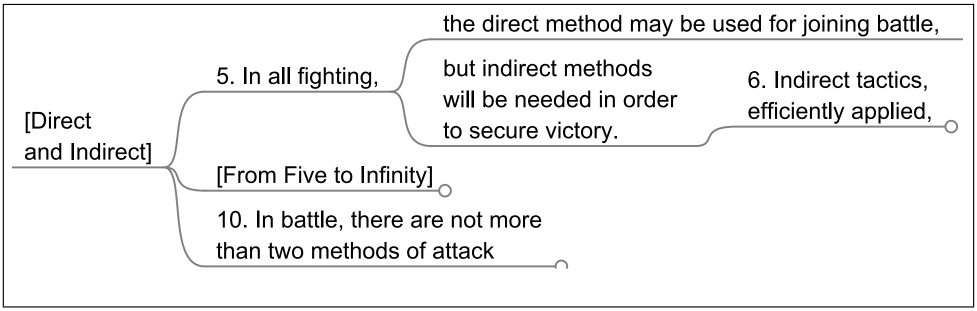

[Direct and Indirect]
5. In all fighting,
the direct method may be used for joining battle,
but indirect methods will be needed in order to secure victory.
6. Indirect tactics, efficiently applied,
[From Five to Infinity]
10. In battle, there are not more than two methods of attack

Fig. 58: Direct and Indirect

In our introduction[1], we showed how Text Tree Mind Maps help in understanding the text, and show how to change the translation, by comparing the English and Chinese mind maps. We are repeating some of the mind map fragments here, to be able to show a complete story.

The original text of paragraph 6 was rendered as in figure 59.

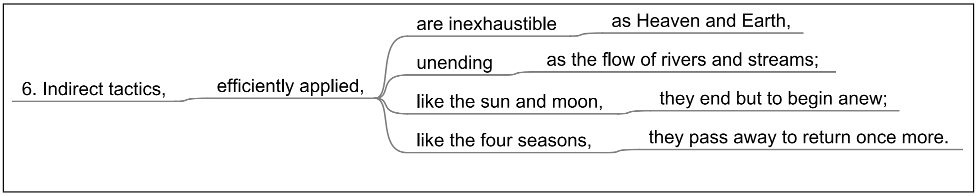

6. Indirect tactics,
efficiently applied,
are inexhaustible
as Heaven and Earth,
unending
as the flow of rivers and streams;
like the sun and moon,
they end but to begin anew;
like the four seasons,
they pass away to return once more.

Fig. 59: AoW Ch. V, par 6: Indirect Tactics, English - original text

Sun Tzu explains each of the four aspects metaphorically as a pair of opposites. A look at the Chinese version of the mind map, in figure 60, shows that the structures of the English and the Chinese mind maps are similar, but not the same. There are four metaphors here: *heaven and earth (天 and 地), rivers and streams (江 and 河), sun and moon (日 and 月), four seasons (四时)*. In the English version the first two aspects start with their explanation, and the last two start with the metaphor. In the Chinese mind map the structure of all four aspects is the same: the explanation first and then the metaphor.

---

[1] see: Logic and Mind Maps, on page 4

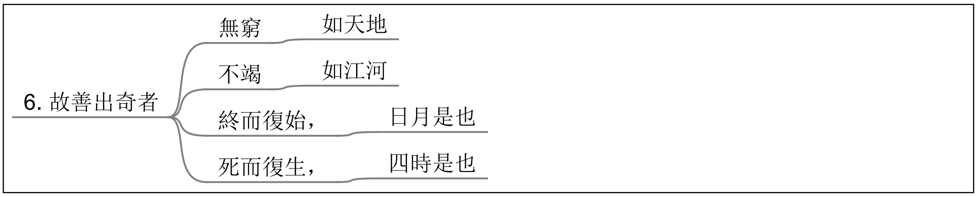

6. 故善出奇者
無窮
如天地
不竭
如江河
終而復始，
日月是也
死而復生，
四時是也

Fig. 60: AoW Ch. V, par 6: Indirect Tactics, Chinese

The rhythm of the Chinese version is preferable and moreover, we would like the English translation to follow the original Chinese as close as possible. Therefore we changed the English text slightly, until it becomes as in the mind map fragment in figure 61. We have seen this example in the introduction to this book, The Mind Map Method, on page 5.

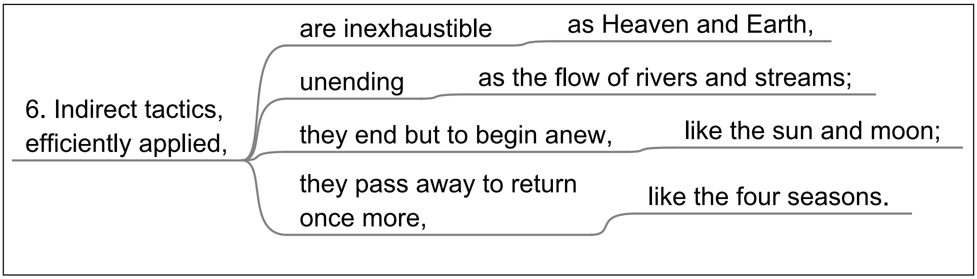

6. Indirect tactics, efficiently applied,
are inexhaustible
as Heaven and Earth,
unending
as the flow of rivers and streams;
they end but to begin anew,
like the sun and moon;
they pass away to return once more,
like the four seasons.

Fig. 61: AoW Ch. V, par 6: Indirect Tactics, English - adapted text

From Five to Infinity

We used this part earlier to explain how we found interesting text using mindmaps.[2] Sun Tzu uses the *from five to infinity* examples to explain how limited means can yield unlimited possibilities. Such as making as many melodies as you want from just the five musicl notes that were known in ancient China.

The *enumeration* patterns we find here are more or less hidden. Although Sun Tzu mentions *five* musical notes, *five* primary colors, and *five* cardinal tastes, he does not specify what they are in the Chinese text. Presumably because he supposes that this is known to his readers. Therefore, we left them out in our mind map too. For clarity, we mention them here:

- The five musical notes from the Chinese pentatonic scale are: gōng 宫, shāng 商, jué 角, zhǐ 徵 and yǔ 羽.
- There are not more than five primary colors (blue, yellow, red, white, and black).
- There are not more than five cardinal tastes (sour, acrid, salt, sweet, bitter).

---

[2] see: Finding Interesting Text, on page 37.

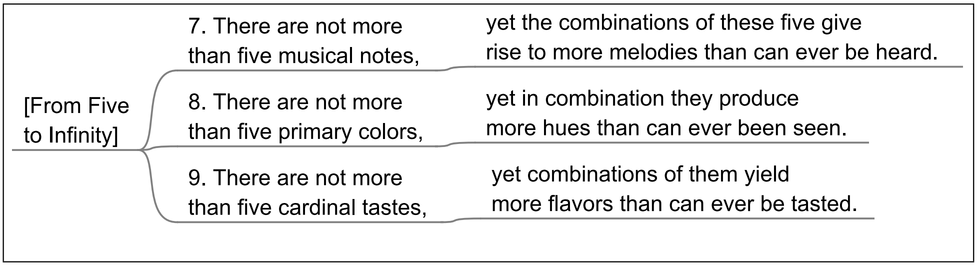

[From Five to Infinity]
7. There are not more than five musical notes,
yet the combinations of these five give rise to more melodies than can ever be heard.
8. There are not more than five primary colors,
yet in combination they produce more hues than can ever been seen.
9. There are not more than five cardinal tastes,
yet combinations of them yield more flavors than can ever be tasted.

Fig. 62: From Five to Infinity

Apparently the translator Lionel Giles [24], on which the translations of our mind maps are based, thought these would not be known to his readers, therefore he spelled them out.

Two Methods of Attack

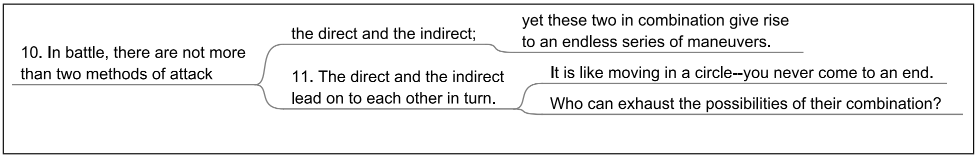

10. In battle, there are not more than two methods of attack
the direct and the indirect;
yet these two in combination give rise to an endless series of maneuvers.
11. The direct and the indirect lead on to each other in turn.
It is like moving in a circle--you never come to an end.
Who can exhaust the possibilities of their combination?

Fig. 63: From Five to Infinity

The essential enumeration in this subtopic in paragraph 10 is actually only two items. see figure 58:

> In battle, there are not more than two methods of attack: the direct and the indirect.

We categorize this enumeration pattern as a pair of opposites, because direct and indirect have opposite meanings.

In addition, we find some *metaphor* patterns in paragraph 6, where the first three of these are also *pairs of opposites*: Heaven and Earth, Flow of Rivers and Streams, Sun and Moon, Four Seasons. See 58.

To summarize the patterns found in this subsection about direct and indirect methods: [3]

- **Enumeration**
  - Two methods of attack: direct and indirect.
- **Pairs of Opposites**
  - direct and indirect,
  - Heaven and Earth,
  - Flow of Rivers and Streams,

---

[3] Direct and Indirect, on page 177

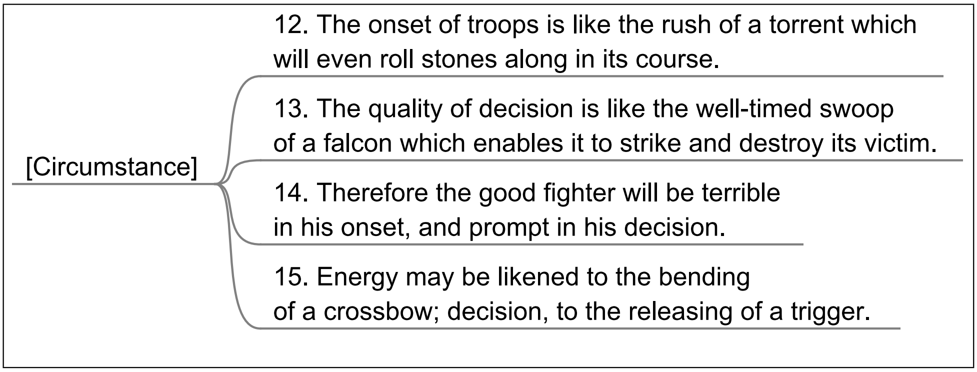
  - Sun and Moon,

- **Conditional Sentences**
  - Par. 6: `=> Judge. （故）`. The content is a metaphor.

Circumstance

Here, the circumstances are described rather verbose, with a set of *metaphors*:

- par. 12: The onset of troops is like the rush of a torrent …
- par. 13: The quality of decision is like the well-timed swoop of a falcon …
- par. 15: Energy may be likened to the bending of a crossbow; decision, to the releasing of a trigger.



12. The onset of troops is like the rush of a torrent which will even roll stones along in its course.

13. The quality of decision is like the well-timed swoop of a falcon which enables it to strike and destroy its victim.

14. Therefore the good fighter will be terrible in his onset, and prompt in his decision.

15. Energy may be likened to the bending of a crossbow; decision, to the releasing of a trigger.

Fig. 64: Circumstance

- **Conditional Sentences**
  - Par. 12-13: `2 Judge.`; 也 indicates the essence of the sentence. Metaphor.
  - Par. 14: `=> Judge. （故）`.

Order and Disorder

In this section we see several patterns, of which a transposition of the text that we made is the most interesting.

Transposition in paragraphs 17 and 18

Transposition means that we broke the order of the original text in the mind map of AoW chapter 5. In this subsection we describe how and why.

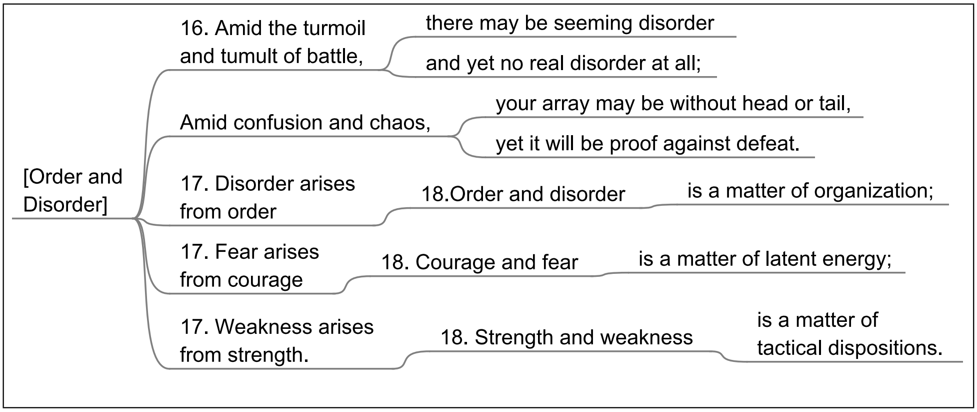

[Order and Disorder]
16. Amid the turmoil and tumult of battle,
there may be seeming disorder
and yet no real disorder at all;
Amid confusion and chaos,
your array may be without head or tail,
yet it will be proof against defeat.
17. Disorder arises from order
18.Order and disorder
is a matter of organization;
17. Fear arises from courage
18. Courage and fear
is a matter of latent energy;
17. Weakness arises from strength.
18. Strength and weakness
is a matter of tactical dispositions.

Fig. 65: Order and Disorder

Here is the original text of paragraph 17 and 18:

> 17. Simulated disorder postulates perfect discipline, simulated fear postulates courage; simulated weakness postulates strength.
>
> 18. Hiding order beneath the cloak of disorder is simply a question of subdivision; concealing courage under a show of timidity presupposes a fund of latent energy; masking strength with weakness is to be effected by tactical dispositions.

In the mind map, after breaking paragraph 17 into three sub-nodes, we can break paragraph 18 into three corresponding sub-nodes, and attached the corresponding sub-nodes one by one following the three ones from paragraph 17. As you can see in the final mind map, see figure 65 in this chapter, there are three sub-sections under the parent node [Appearance], instead of six (3 + 3).

That is because paragraph 17 and 18 have a one-to-one correspondence to their subparts, logically. In order to make this logical correspondence explicit, thanks to the power of mind mapping, we decided to let this pattern outweigh the following of the original text order strictly.

The three sub-parts of paragraph 17 and 18 talk about three pairs of situations:

1. Order and disorder (治 and 亂),
2. Courage and fear (勇 and 怯),
3. Strength and weakness (強 and 弱).

paragraph 17 focuses on how one situation arises from the other:

亂生于治 Disorder arises from order.
怯生于勇 Fear arises from courage.
弱生于強 Weakness arises from strength.

paragraph 18 summarizes each of these pairs of relations:

治亂，數也 Order and disorder - a matter of subdivision.
勇怯，勢也 Courage and fear - a matter of latent energy.
強弱，形也 Strength and weakness - a matter of dispositions.

The first sub-part of paragraph 17 corresponds to the first sub-parts of paragraph 18, the second of 17 corresponds to the second of paragraph 18, and same for the third sub-parts.

In particular, let's name the four characters in a sub-part of paragraph 17 as: ABCD, and name the four characters in a sub-part of paragraph 18 as: EFGH. Then you can see that A = F, D = E. In fact, and D-A pair is the pair of relations we mentioned earlier, and D-A appears to be exactly EF - the first two characters of a sub-part of paragraph 18.

You may also observe that the BC characters in a subpart of paragraph 17 appear to be same across all three sub-parts, and that the last character of a subpart of paragraph 18 is also the same across the three paragraphs. If we replace these "replicating" characters with lowercase letters, and use the same latin letter for the same Chinese character, we can write down the pattern of paragraphs 17 and 18 as:

```
Par. 17: BxyA, DxyC, FxyE
Par. 18: AB, Lz; CD, Mz; EF, Nz.
```

It's like transposing a matrix of AB, CD, EF pairs: we decided to put AB from 17 and AB from 18 together, and thus rearranged that part of the mind map. We believe this is the power of mind mapping to make such hidden logical correspondence visible.

- **Conditional Sentences**
  - Par. 17-18: `6 (Adv. => Conseq.)` (reversed condition indicated by 也).

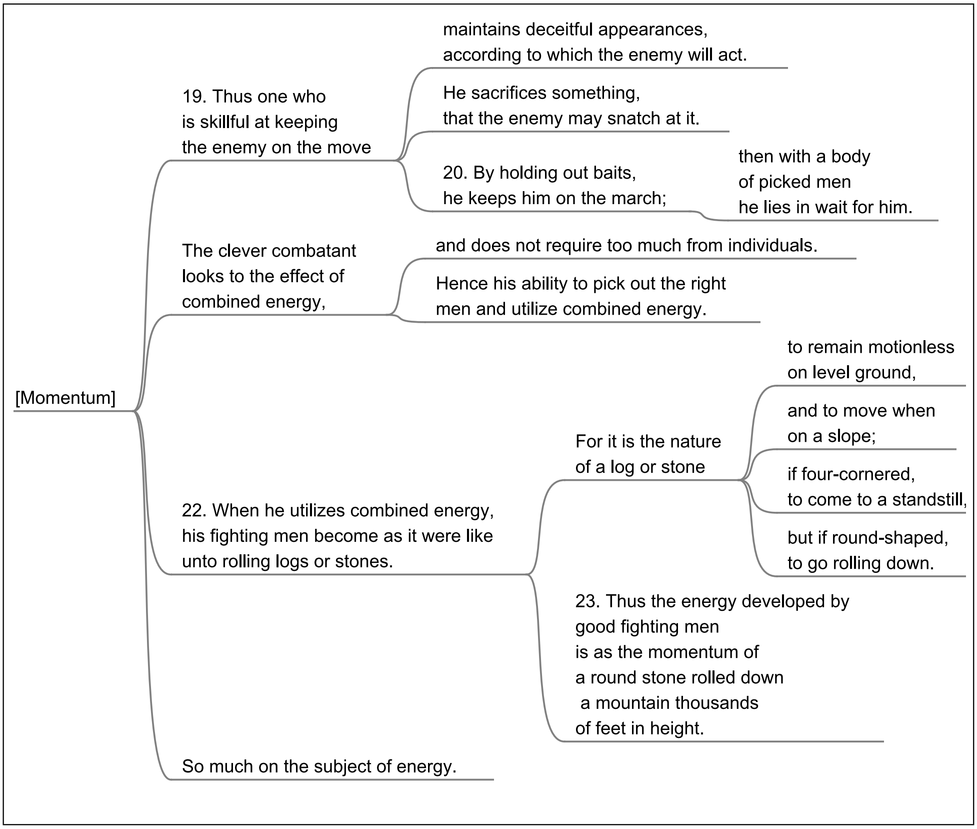
The text in these paragraphs have a set of pairs of opposites:

- **Pairs of Opposites**
  - Order and disorder,
  - fear and courage,
  - strength and weakness.

Momentum

We see another *metaphor* here: rolling logs or stones, see par. 22 and 23.

- **Conditional Sentences**
  - Par. 19: `2 (Adv. => Coseq.) (故)`.
  - Par. 20: `2 (Adv. => Conseq.)`.
  - Par. 21: `2 (=> Judge. (故))`.
  - Par. 22: `(Cond. => Conseq.)`; Metaphor.
  - Par. 23: `=> Judge. (故)`; Metaphor.



[Momentum]

19. Thus one who is skillful at keeping the enemy on the move

maintains deceitful appearances, according to which the enemy will act.

He sacrifices something, that the enemy may snatch at it.

20. By holding out baits, he keeps him on the march;

then with a body of picked men he lies in wait for him.

The clever combatant looks to the effect of combined energy,

and does not require too much from individuals.

Hence his ability to pick out the right men and utilize combined energy.

22. When he utilizes combined energy, his fighting men become as it were like unto rolling logs or stones.

For it is the nature of a log or stone

to remain motionless on level ground,

and to move when on a slope;

if four-cornered, to come to a standstill,

but if round-shaped, to go rolling down.

23. Thus the energy developed by good fighting men is as the momentum of a round stone rolled down a mountain thousands of feet in height.

So much on the subject of energy.

Fig. 66: Momentum

Structured Text

V. ENERGY

- **Sun Tzu Said:**

- **Army Size**

The control of a large force is the same principle as the control of a few men:
  » it is merely a matter of dividing up their numbers.
2. Fighting with a large army under your command is nowise different from fighting with a small one:
  » it is merely a matter of instituting signs and signals.

- **Weak and Strong**

3. To ensure that your whole host may withstand the brunt of the enemy's attack and remain unshaken
  » this is effected by maneuvers direct and indirect.
4. That the impact of your army may be like a grindstone dashed against an egg--
  » this is effected by the science of weak points and strong.

- **Direct and Indirect**

5. In all fighting,
  » the direct method may be used for joining battle,
  » but indirect methods will be needed in order to secure victory.
    ° 6. Indirect tactics, efficiently applied,
      - are inexhaustible
        - as Heaven and Earth,
      - unending
        - as the flow of rivers and streams;
      - they end but to begin anew,
        - like the sun and moon;
      - they pass away to return once more,
        - like the four seasons.
[From Five to Infinity]
  » 7. There are not more than five musical notes,
    ° yet the combinations of these five give rise to more melodies than can ever be heard.
  » 8. There are not more than five primary colors,
    ° yet in combination they produce more hues than can ever been seen.
  » 9. There are not more than five cardinal tastes,
    ° yet combinations of them yield more flavors than can ever be tasted.
10. In battle, there are not more than two methods of attack
  » the direct and the indirect;
    ° yet these two in combination give rise to an

    - endless series of maneuvers.
  - 11. The direct and the indirect lead on to each other in turn.
    - It is like moving in a circle--you never come to an end.
    - Who can exhaust the possibilities of their combination?

- **Circumstance**

  12. The onset of troops is like the rush of a torrent which will even roll stones along in its course.
  13. The quality of decision is like the well-timed swoop of a falcon which enables it to strike and destroy its victim.
  14. Therefore, the good fighter will be terrible in his onset, and prompt in his decision.
  15. Energy may be likened to the bending of a crossbow; decision, to the releasing of a trigger.

- **Order and Disorder**

  16. Amid the turmoil and tumult of battle,
    - there may be seeming disorder
    - and yet no real disorder at all;

  Amid confusion and chaos,
    - your array may be without head or tail,
    - yet it will be proof against defeat.

  17. Disorder arises from order
    - 18.Order and disorder
      - is a matter of organization;

  17. Fear arises from courage
    - 18. Courage and fear
      - is a matter of latent energy;

  17. Weaknes arises from strength.
    - 18. Strength and weakness
      - is a matter of tactical dispositions.

- **Momentum**

  19. Thus one who is skillful at keeping the enemy on the move
    - maintains deceitful appearances, according to which the enemy will act.
    - He sacrifices something, that the enemy may snatch at it.
    - 20. By holding out baits, he keeps him on the march;
      - then with a body of picked men he lies in wait for him.

  The clever combatant looks to the effect of combined energy,
    - and does not require too much from individuals.
    - Hence his ability to pick out the right men and utilize combined energy.

  22. When he utilizes combined energy, his fighting men become as it were like unto rolling logs or stones.

» For it is the nature of a log or stone
  ° to remain motionless on level ground,
  ° and to move when on a slope;
  ° if four-cornered, to come to a standstill,
  ° but if round-shaped, to go rolling down.

» 23. Thus the energy developed by good fighting men is as the momentum of a round stone rolled down a mountain thousands of feet in height.

So much on the subject of energy.

VI. WEAK POINTS AND STRONG - 虛實

Abstract This chapter is involved with finding weaknesses of the enemy and using ones own strength. Some game theoretical aspects are used for his explanation. We used this chapter to show the pervasiveness of Conditional Sentence patterns in Sun Tzu's text, by coloring the various types of patterns.

Zhuge Liang defeating Sun Li.

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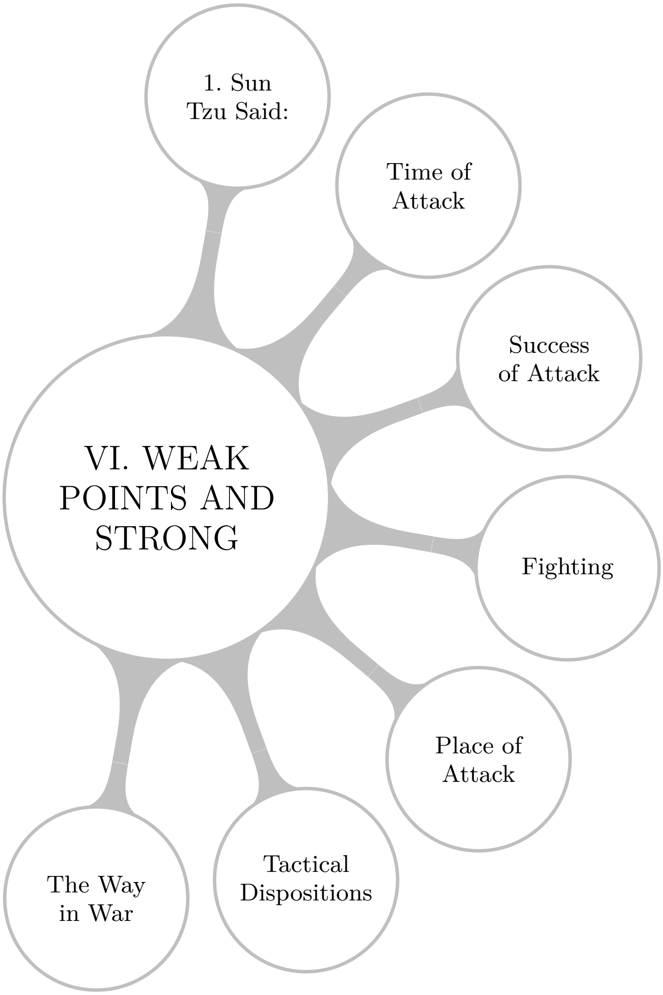
P. van Emde Boas et al., *Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps*, Logic in Asia: Studia Logica Library,
https://doi.org/10.1007/978-981-19-6250-9_16

Main Concepts


1. Sun Tzu Said:
Time of Attack
Success of Attack
VI. WEAK POINTS AND STRONG
Fighting
Place of Attack
The Way in War
Tactical Dispositions

Overview of the Contents

In Mair's translation [46], the title of this chapter is *Emptiness and Solidity*, and indeed this could be a literal translation, but as most of the chapter is about finding the weaknesses of the enemy and using ones own strengths, the title of the Giles translation seem more appropriate. An alternative translation closer to the actual Chinese text would be: The Fake and the Real.

An illustrative quote from paragraph 2 in this chapter is: Therefore the clever combatant imposes his will on the enemy, but does not allow the enemy's will to be imposed on him.

Mind Maps

The overview for this chapter can be found in mind map figures 23 to 28.

To show the pervasiveness of reasoning in Sun Tzu's work, we have colored the English overview mind maps for this chapter. The legend for the colors is as in figure 67. A few more colored mind maps can be found online, `https://suntzu.squaringthecircles.com/`.

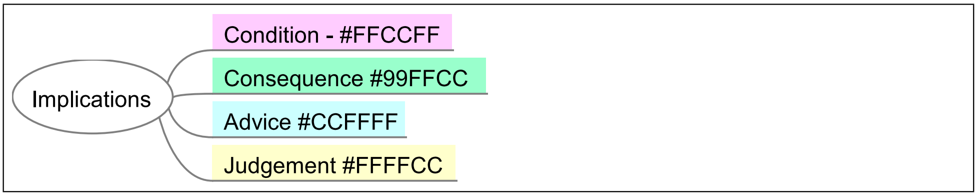
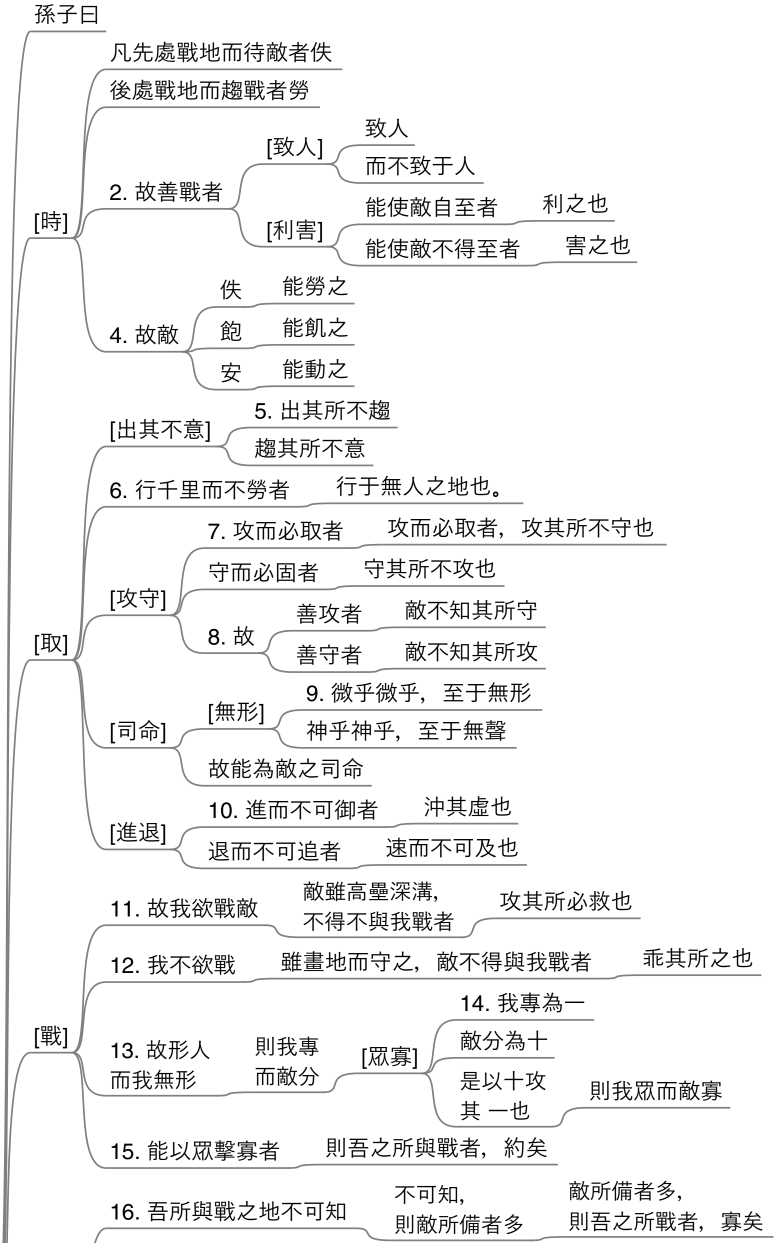
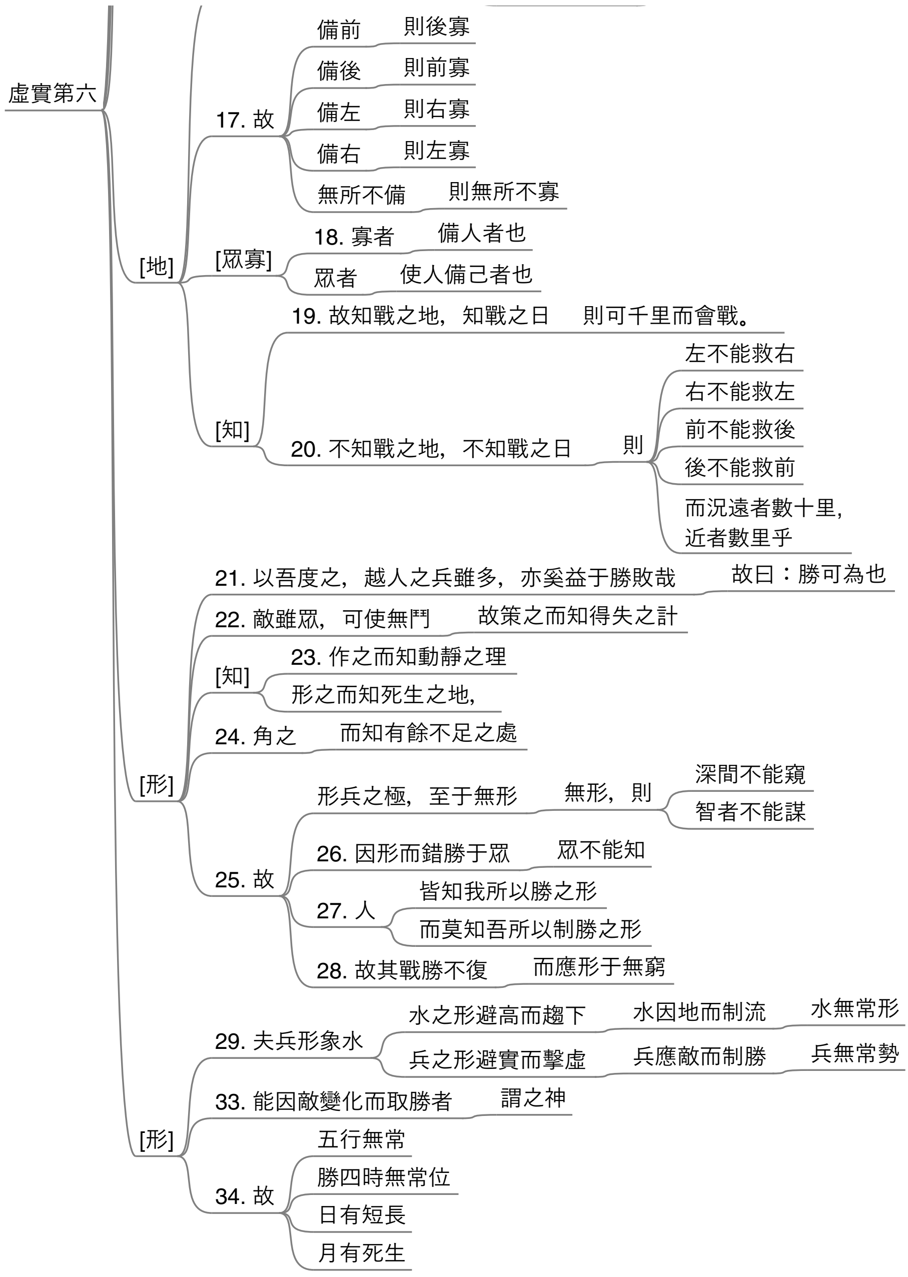

Implications
Condition - #FFCCFF
Consequence #99FFCC
Advice #CCFFFF
Judgement #FFFFCC

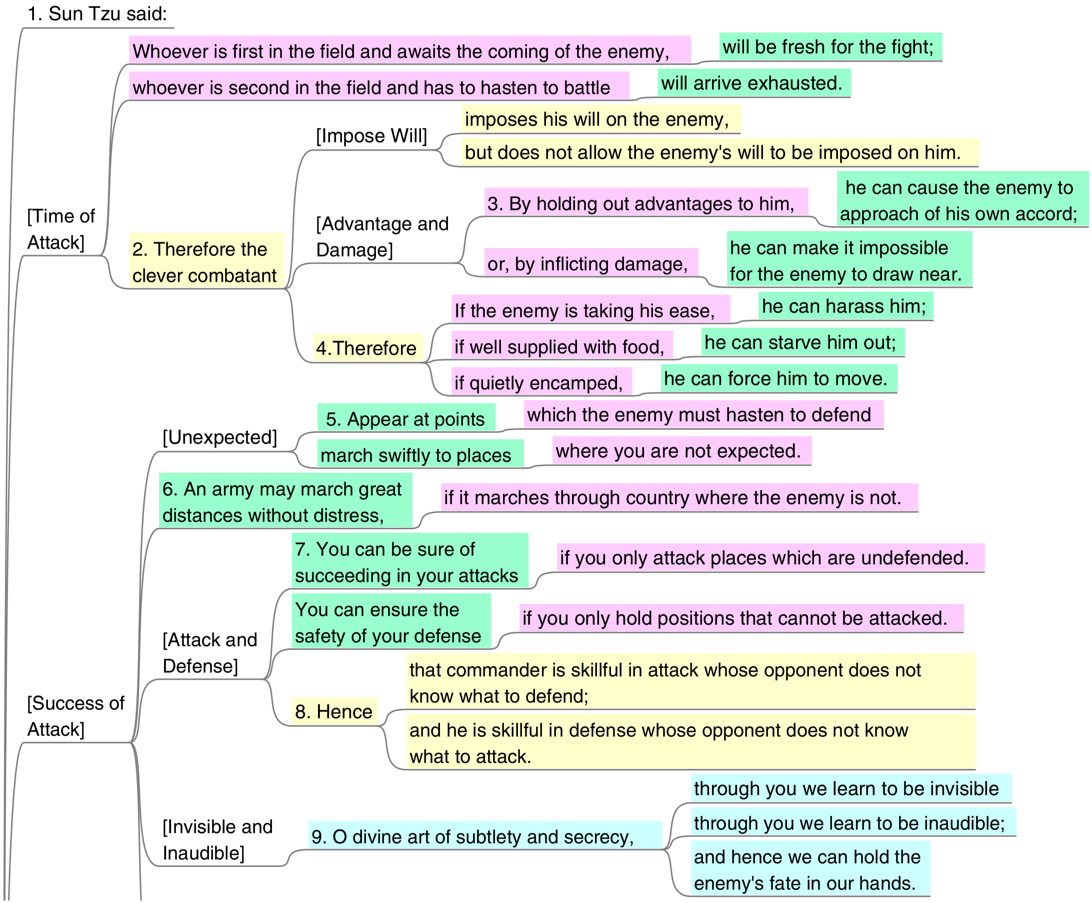
Fig. 67: Implication Coloring


孫子曰
[時]
凡先處戰地而待敵者佚
後處戰地而趨戰者勞
2. 故善戰者
[致人]
致人
而不致于人
[利害]
能使敵自至者
利之也
能使敵不得至者
害之也
4. 故敵
佚
能勞之
飽
能飢之
安
能動之
[取]
[出其不意]
5. 出其所不趨
趨其所不意
6. 行千里而不勞者
行于無人之地也。
[攻守]
7. 攻而必取者
攻而必取者，攻其所不守也
守而必固者
守其所不攻也
8. 故
善攻者
敵不知其所守
善守者
敵不知其所攻
[司命]
[無形]
9. 微乎微乎，至于無形
神乎神乎，至于無聲
故能為敵之司命
[進退]
10. 進而不可御者
沖其虛也
退而不可追者
速而不可及也
[戰]
11. 故我欲戰敵
敵雖高壘深溝，
不得不與我戰者
攻其所必救也
12. 我不欲戰
雖畫地而守之，敵不得與我戰者
乖其所之也
13. 故形人
而我無形
則我專
而敵分
[眾寡]
14. 我專為一
敵分為十
是以十攻
其 一也
則我眾而敵寡
15. 能以眾擊寡者
則吾之所與戰者，約矣
16. 吾所與戰之地不可知
不可知，
則敵所備者多
敵所備者多，
則吾之所戰者，寡矣

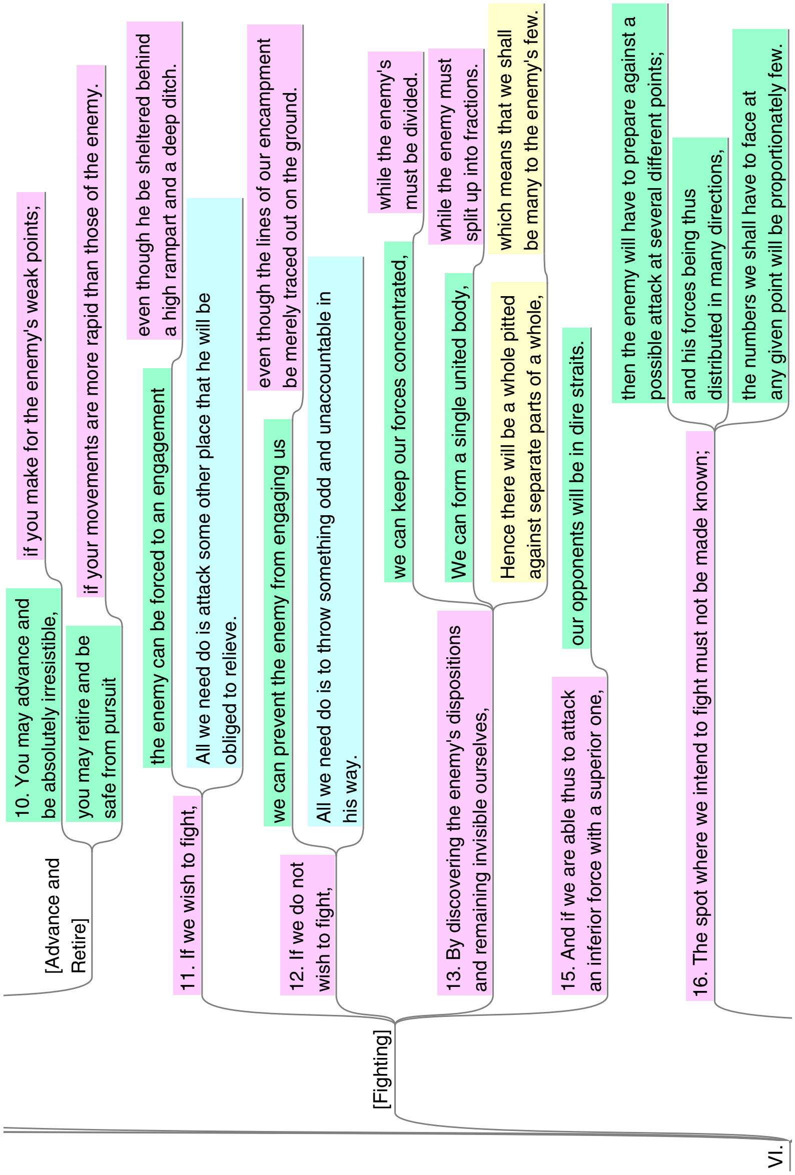
Mind Map 23: AoW Ch.VI - the Chinese Mind Map - Part 1


虛實第六
[地]
17. 故
備前
則後寡
備後
則前寡
備左
則右寡
備右
則左寡
無所不備
則無所不寡
[眾寡]
18. 寡者
備人者也
眾者
使人備己者也
[知]
19. 故知戰之地，知戰之日
則可千里而會戰。
20. 不知戰之地，不知戰之日
則
左不能救右
右不能救左
前不能救後
後不能救前
而況遠者數十里，
近者數里乎
[形]
21. 以吾度之，越人之兵雖多，亦奚益于勝敗哉
故曰：勝可為也
22. 敵雖眾，可使無鬥
故策之而知得失之計
[知]
23. 作之而知動靜之理
形之而知死生之地，
24. 角之
而知有餘不足之處
25. 故
形兵之極，至于無形
無形，則
深間不能窺
智者不能謀
26. 因形而錯勝于眾
眾不能知
27. 人
皆知我所以勝之形
而莫知吾所以制勝之形
28. 故其戰勝不復
而應形于無窮
[形]
29. 夫兵形象水
水之形避高而趨下
水因地而制流
水無常形
兵之形避實而擊虛
兵應敵而制勝
兵無常勢
33. 能因敵變化而取勝者
謂之神
34. 故
五行無常
勝四時無常位
日有短長
月有死生

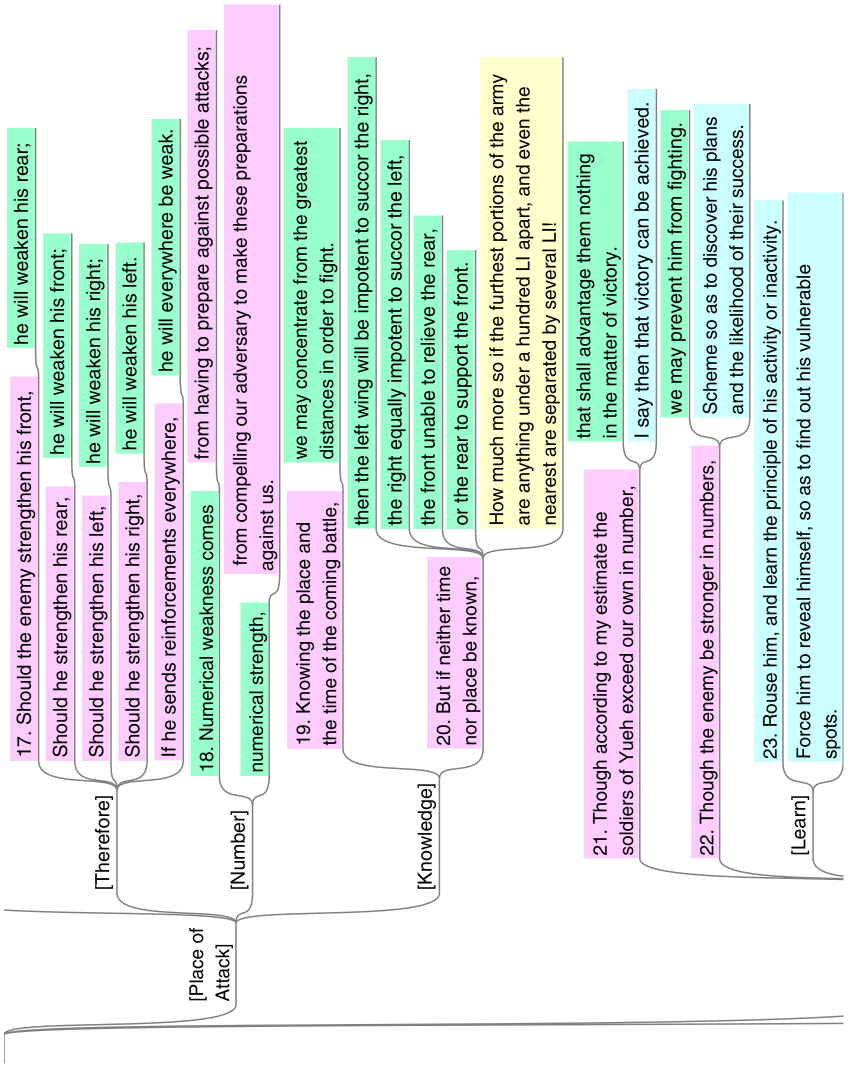
Mind Map 24: AoW Ch.VI - the Chinese Minde Map - Part 2


1. Sun Tzu said:
[Time of Attack]
Whoever is first in the field and awaits the coming of the enemy,
will be fresh for the fight;
whoever is second in the field and has to hasten to battle
will arrive exhausted.
2. Therefore the clever combatant
[Impose Will]
imposes his will on the enemy,
but does not allow the enemy's will to be imposed on him.
[Advantage and Damage]
3. By holding out advantages to him,
he can cause the enemy to approach of his own accord;
or, by inflicting damage,
he can make it impossible for the enemy to draw near.
4.Therefore
If the enemy is taking his ease,
he can harass him;
if well supplied with food,
he can starve him out;
if quietly encamped,
he can force him to move.
[Success of Attack]
[Unexpected]
5. Appear at points
which the enemy must hasten to defend
march swiftly to places
where you are not expected.
6. An army may march great distances without distress,
if it marches through country where the enemy is not.
[Attack and Defense]
7. You can be sure of succeeding in your attacks
if you only attack places which are undefended.
You can ensure the safety of your defense
if you only hold positions that cannot be attacked.
8. Hence
that commander is skillful in attack whose opponent does not know what to defend;
and he is skillful in defense whose opponent does not know what to attack.
[Invisible and Inaudible]
9. O divine art of subtlety and secrecy,
through you we learn to be invisible
through you we learn to be inaudible;
and hence we can hold the enemy's fate in our hands.

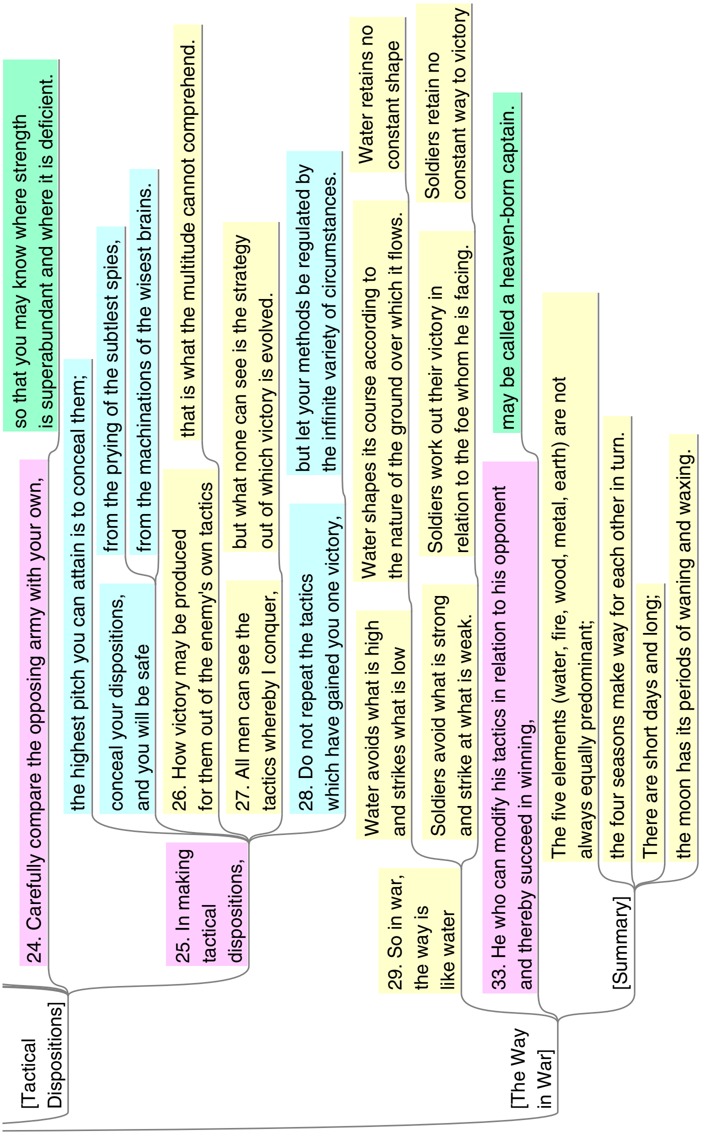
Mind Map 25: Ch.VI - WEAK POINTS AND STRONG - Part 1


VI.
[Fighting]
[Advance and Retire]
10. You may advance and be absolutely irresistible,
if you make for the enemy's weak points;
you may retire and be safe from pursuit
if your movements are more rapid than those of the enemy.
11. If we wish to fight,
the enemy can be forced to an engagement
even though he be sheltered behind a high rampart and a deep ditch.
All we need do is attack some other place that he will be obliged to relieve.
12. If we do not wish to fight,
we can prevent the enemy from engaging us
even though the lines of our encampment be merely traced out on the ground.
All we need do is to throw something odd and unaccountable in his way.
13. By discovering the enemy's dispositions and remaining invisible ourselves,
we can keep our forces concentrated,
while the enemy's must be divided.
We can form a single united body,
while the enemy must split up into fractions.
Hence there will be a whole pitted against separate parts of a whole,
which means that we shall be many to the enemy's few.
15. And if we are able thus to attack an inferior force with a superior one,
our opponents will be in dire straits.
16. The spot where we intend to fight must not be made known;
then the enemy will have to prepare against a possible attack at several different points;
and his forces being thus distributed in many directions,
the numbers we shall have to face at any given point will be proportionately few.

Mind Map 26: Ch.VI - WEAK POINTS AND STRONG - Part 2


[Place of Attack]
[Therefore]
17. Should the enemy strengthen his front,
he will weaken his rear;
Should he strengthen his rear,
he will weaken his front;
Should he strengthen his left,
he will weaken his right;
Should he strengthen his right,
he will weaken his left.
If he sends reinforcements everywhere,
he will everywhere be weak.
[Number]
18. Numerical weakness comes
from having to prepare against possible attacks;
numerical strength,
from compelling our adversary to make these preparations against us.
[Knowledge]
19. Knowing the place and the time of the coming battle,
we may concentrate from the greatest distances in order to fight.
20. But if neither time nor place be known,
then the left wing will be impotent to succor the right,
the right equally impotent to succor the left,
the front unable to relieve the rear,
or the rear to support the front.
How much more so if the furthest portions of the army are anything under a hundred LI apart, and even the nearest are separated by several LI!
21. Though according to my estimate the soldiers of Yueh exceed our own in number,
that shall advantage them nothing in the matter of victory.
I say then that victory can be achieved.
22. Though the enemy be stronger in numbers,
we may prevent him from fighting.
Scheme so as to discover his plans and the likelihood of their success.
[Learn]
23. Rouse him, and learn the principle of his activity or inactivity.
Force him to reveal himself, so as to find out his vulnerable spots.

Mind Map 27: Ch.VI - WEAK POINTS AND STRONG - Part 3



- [Tactical Dispositions]
  - 24. Carefully compare the opposing army with your own,
    - so that you may know where strength is superabundant and where it is deficient.
  - 25. In making tactical dispositions,
    - the highest pitch you can attain is to conceal them;
    - conceal your dispositions, and you will be safe
      - from the prying of the subtlest spies,
      - from the machinations of the wisest brains.
    - 26. How victory may be produced for them out of the enemy's own tactics
      - that is what the multitude cannot comprehend.
    - 27. All men can see the tactics whereby I conquer,
      - but what none can see is the strategy out of which victory is evolved.
    - 28. Do not repeat the tactics which have gained you one victory,
      - but let your methods be regulated by the infinite variety of circumstances.
- [The Way in War]
  - 29. So in war, the way is like water
    - Water avoids what is high and strikes what is low
      - Water shapes its course according to the nature of the ground over which it flows.
        - Water retains no constant shape
    - Soldiers avoid what is strong and strike at what is weak.
      - Soldiers work out their victory in relation to the foe whom he is facing.
        - Soldiers retain no constant way to victory
  - 33. He who can modify his tactics in relation to his opponent and thereby succeed in winning,
    - may be called a heaven-born captain.
  - [Summary]
    - The five elements (water, fire, wood, metal, earth) are not always equally predominant;
    - the four seasons make way for each other in turn.
    - There are short days and long;
    - the moon has its periods of waning and waxing.

Mind Map 28: Ch.VI - WEAK POINTS AND STRONG - Part 4

Details and Patterns

The chapter title, **weak points and strong** is an example of a *pair of opposites* pattern.

Sun Tzu Said:

As in most chapters, the first line of AoW chapter VI contains the universal quantifier character 凡 (fán): 凡先处战地而待敌者佚 …

Therefore, the first paragraph gives a general description of the discussion in the chapter.

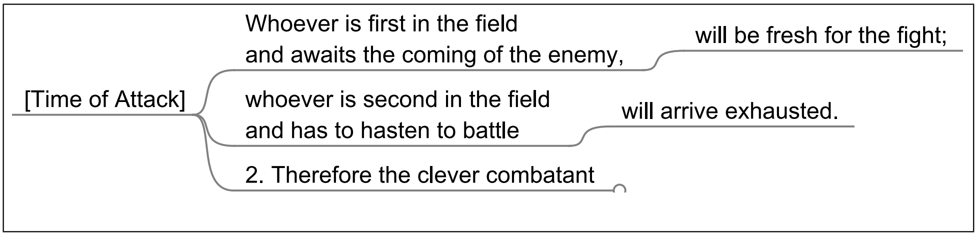

[Time of Attack]
Whoever is first in the field and awaits the coming of the enemy,
will be fresh for the fight;
whoever is second in the field and has to hasten to battle
will arrive exhausted.
2. Therefore the clever combatant

Fig. 68: Sun Tzu Said, Time of Attack

We see two opposed conditions, being the first or the second in the field, and we are given the consequences of both:

- **Conditional Sentences**
    - Par 1: Universal quantification 凡
    - Par. 1: `2( Cond. => Conseq.) ;`

Time of Attack

There are several *pairs of opposites* in this section, meant to illustrate how an enemy condition can be reversed. The Conditional Sentences in this paragraph illustrate this.

- **Pairs of Opposites**
    - Par. 4: **At Ease and Harass**.
    - Par. 4: **supplied with food, or starve**.
    - Par. 4: **Encamp and Move**.

- **Conditional Sentences**
    - Par. 2: `=> Judge. (故)`
    - Par. 3: `(2 Cond. => Conseq.)` (indicated by 也).
    - Par. 4: `Complex Judge. (故) (3 (Cond. => Conseq.))` .

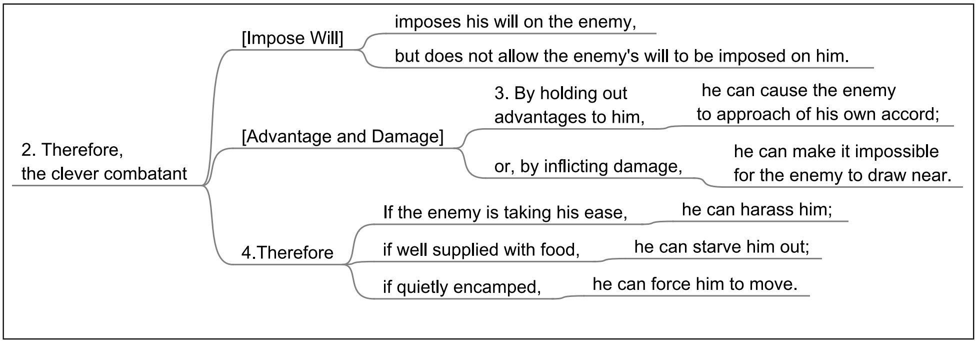

2. Therefore,
the clever combatant
[Impose Will]
imposes his will on the enemy,
but does not allow the enemy's will to be imposed on him.
[Advantage and Damage]
3. By holding out advantages to him,
he can cause the enemy to approach of his own accord;
or, by inflicting damage,
he can make it impossible for the enemy to draw near.
4.Therefore
If the enemy is taking his ease,
he can harass him;
if well supplied with food,
he can starve him out;
if quietly encamped,
he can force him to move.

Fig. 69: Time of Attack

Success of Attack

This section outlines some rules for attacking the enemy successfully. In paragraph 8 conclusions are shown about what the outlined strategy will bring. Paragraph 9 is a poetic description of the strategy that was outlined in the previousparagraphs.

- **Pairs of Opposites**
  - Par. 7-8: **Attack and Defend**.
  - Par. 10: **Advance and Retire**.

- **Conditional Sentences**
  - Par. 5-7: `(Conseq. <= Cond.)`.
    A backwards arrow (<=) shows a backward implication, indicated by 也.
  - Par. 8: `=> 2 Judge. (故)`.
  - Par. 9: `=> 3 Judge. (故)`.
  - Par. 10: `(2 Conseq. <= Cond.)`
    Backwards implication, indicated by 也.

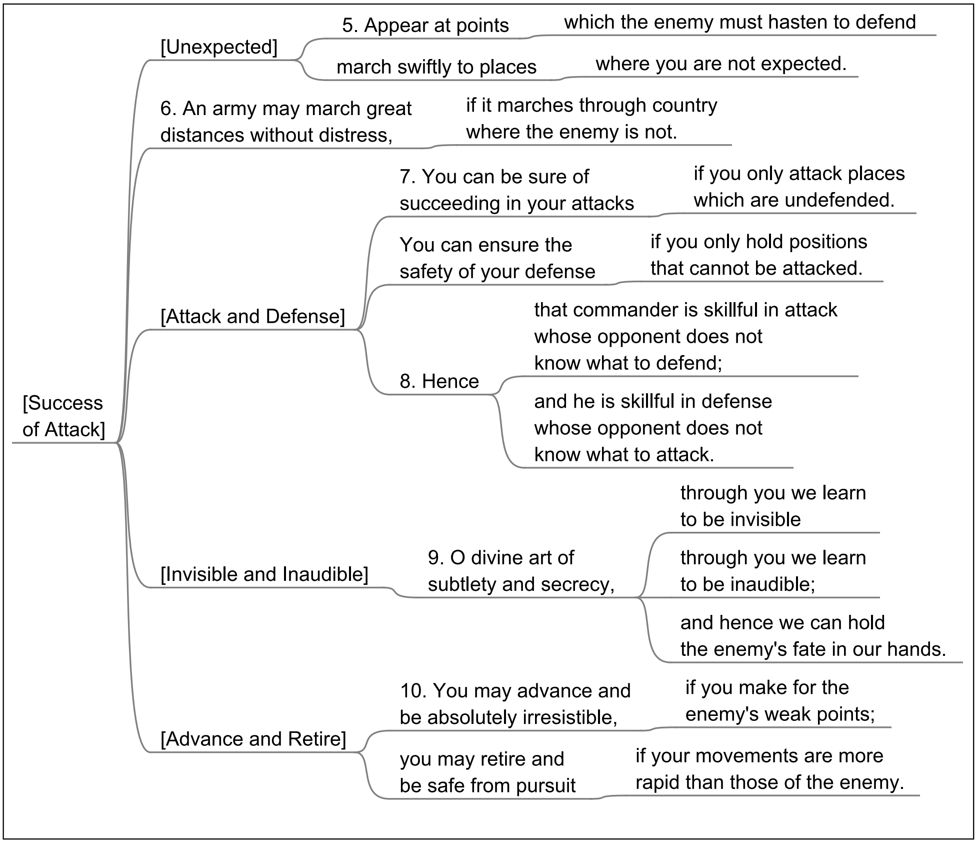

[Success of Attack]
[Unexpected]
5. Appear at points
which the enemy must hasten to defend
march swiftly to places
where you are not expected.
6. An army may march great distances without distress,
if it marches through country where the enemy is not.
[Attack and Defense]
7. You can be sure of succeeding in your attacks
if you only attack places which are undefended.
You can ensure the safety of your defense
if you only hold positions that cannot be attacked.
8. Hence
that commander is skillful in attack whose opponent does not know what to defend;
and he is skillful in defense whose opponent does not know what to attack.
[Invisible and Inaudible]
9. O divine art of subtlety and secrecy,
through you we learn to be invisible
through you we learn to be inaudible;
and hence we can hold the enemy's fate in our hands.
[Advance and Retire]
10. You may advance and be absolutely irresistible,
if you make for the enemy's weak points;
you may retire and be safe from pursuit
if your movements are more rapid than those of the enemy.

Fig. 70: Success of Attack

Fighting

- **Pairs of Opposites**
  - Par. 13: **Concentrate and Divide**.
  - Par. 14: **Whole and Separate Parts**.

- **Conditional Sentences**
  - Par. 11: `(Cond. (Conseq. <= Cond), Adv.)` (故) Backwards implication, indicated by 也.
  - Par. 12: `(Cond. (Conseq. <= Cond), Judge.)` (Backwards implication, indicated by 也)
  - Par. 13: `(Cond. 2 (Conseq. <= Cond), Judge.)` (故), backwards implications.
  - Par. 15: `Cond. => Conseq.`

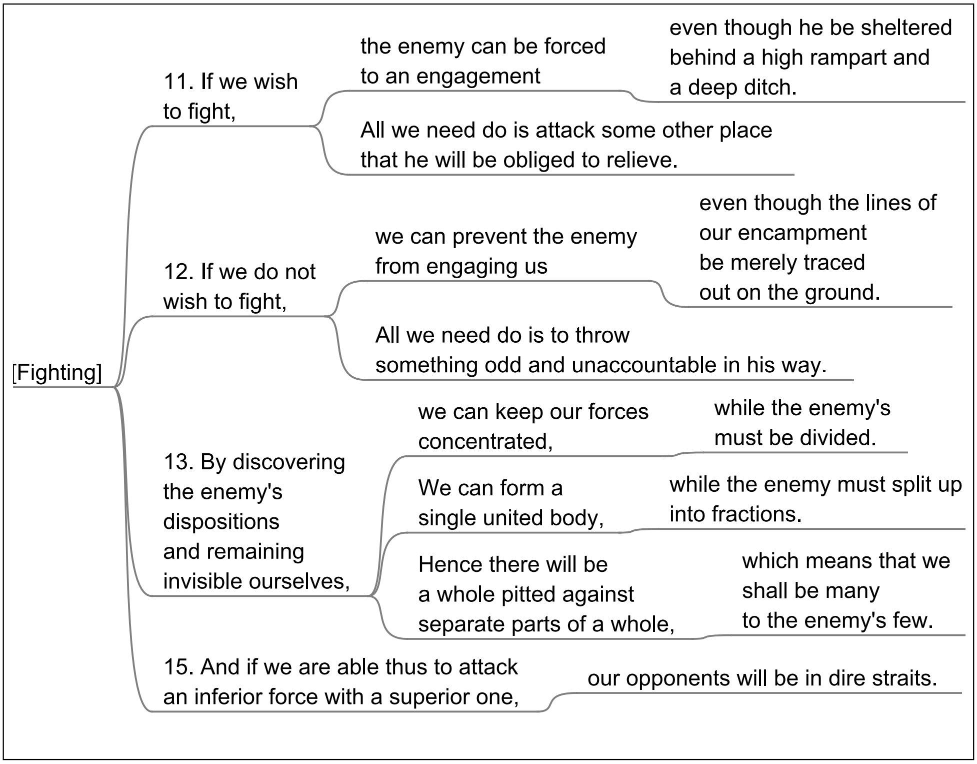

[Fighting]
11. If we wish to fight,
the enemy can be forced to an engagement
even though he be sheltered behind a high rampart and a deep ditch.
All we need do is attack some other place that he will be obliged to relieve.
12. If we do not wish to fight,
we can prevent the enemy from engaging us
even though the lines of our encampment be merely traced out on the ground.
All we need do is to throw something odd and unaccountable in his way.
13. By discovering the enemy's dispositions and remaining invisible ourselves,
we can keep our forces concentrated,
while the enemy's must be divided.
We can form a single united body,
while the enemy must split up into fractions.
Hence there will be a whole pitted against separate parts of a whole,
which means that we shall be many to the enemy's few.
15. And if we are able thus to attack an inferior force with a superior one,
our opponents will be in dire straits.

Fig. 71: Fighting

Place of Attack

Sun Tzu argues here that there is a lot of advantage when the enemy does not know where you are. The enemy must then try to be strong at all fronts, while Sun Tzu's own army can concentrate on fighting the weakest spot of the enemy.

The strong example here is paragraph 17, where there are five conditions, with five conclusions. In fact this is an informal enumeration of where the enemy could be strong and weak: front, rear, left, right and all sides.

- **Pairs of Opposites**
  - Par. 17: **Front and Rear, Left and Right, Reinforce and Weaken**.

- **Implications**
  - Par. 16: `Cond. => 3 Conseq.` .
  - Par. 17: `=> 5(Cond. => Conseq.) implicated by (故)` .
  - Par. 18: `2(Conseq. <= Cond.)`
    (Backwards implication, indicated by 也).
  - Par. 19: `Cond. => Conseq.(故)` .
  - Par. 20: `Cond. => (4 Conseq., Judge.)` .

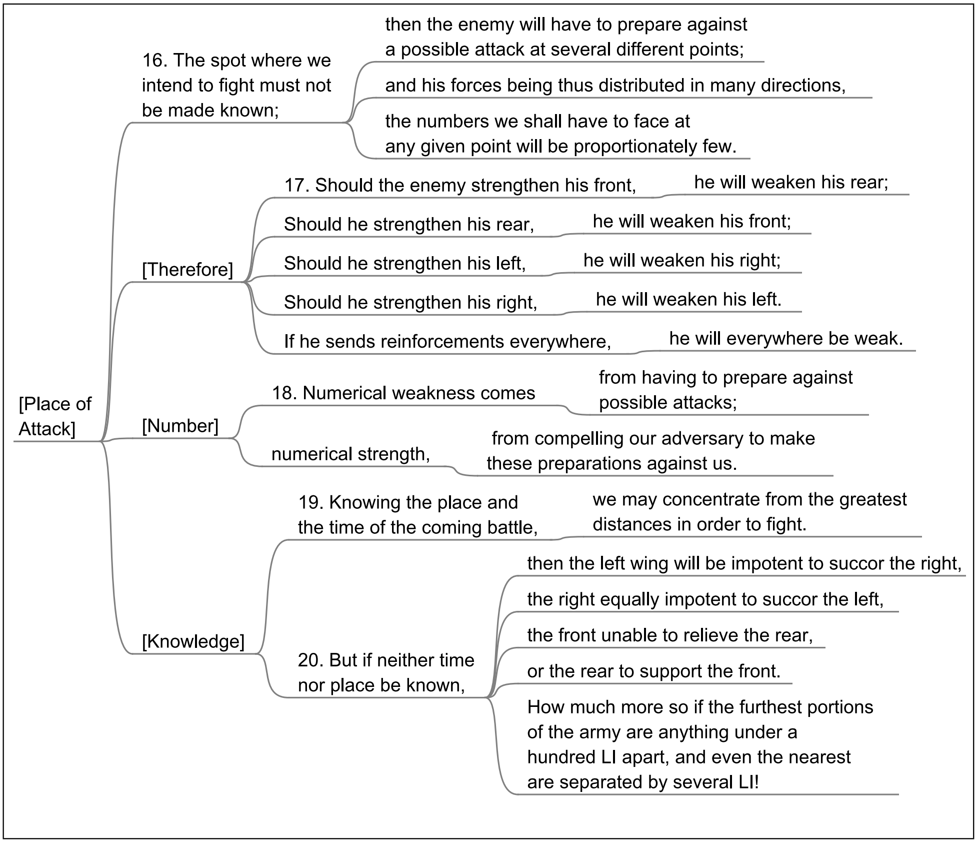

[Place of Attack]
16. The spot where we intend to fight must not be made known;
then the enemy will have to prepare against a possible attack at several different points;
and his forces being thus distributed in many directions,
the numbers we shall have to face at any given point will be proportionately few.
[Therefore]
17. Should the enemy strengthen his front,
he will weaken his rear;
Should he strengthen his rear,
he will weaken his front;
Should he strengthen his left,
he will weaken his right;
Should he strengthen his right,
he will weaken his left.
If he sends reinforcements everywhere,
he will everywhere be weak.
[Number]
18. Numerical weakness comes
from having to prepare against possible attacks;
numerical strength,
from compelling our adversary to make these preparations against us.
[Knowledge]
19. Knowing the place and the time of the coming battle,
we may concentrate from the greatest distances in order to fight.
20. But if neither time nor place be known,
then the left wing will be impotent to succor the right,
the right equally impotent to succor the left,
the front unable to relieve the rear,
or the rear to support the front.
How much more so if the furthest portions of the army are anything under a hundred LI apart, and even the nearest are separated by several LI!

Fig. 72: Place of Attack

Tactical Dispositions

This subject shows several conclusions and some advice.

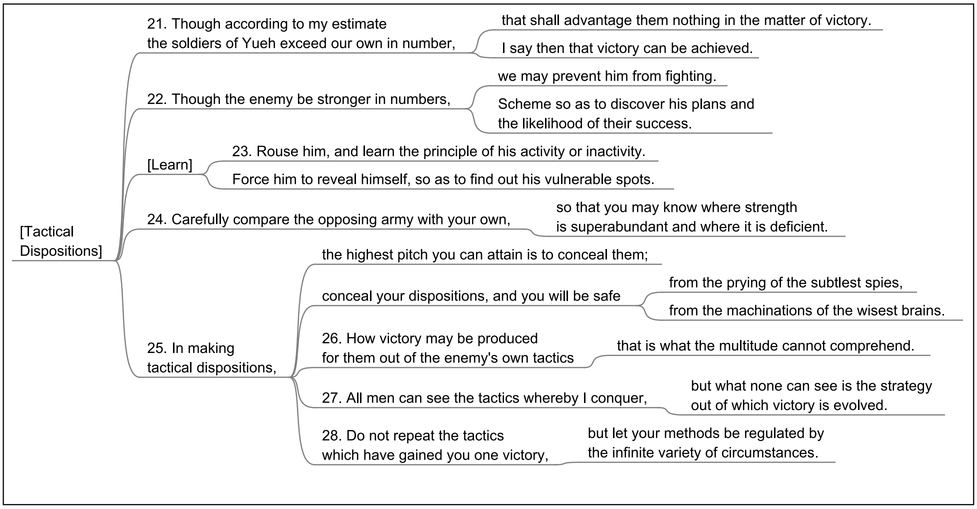

[Tactical Dispositions]
21. Though according to my estimate the soldiers of Yueh exceed our own in number,
that shall advantage them nothing in the matter of victory.
I say then that victory can be achieved.
22. Though the enemy be stronger in numbers,
we may prevent him from fighting.
Scheme so as to discover his plans and the likelihood of their success.
[Learn]
23. Rouse him, and learn the principle of his activity or inactivity.
Force him to reveal himself, so as to find out his vulnerable spots.
24. Carefully compare the opposing army with your own,
so that you may know where strength is superabundant and where it is deficient.
25. In making tactical dispositions,
the highest pitch you can attain is to conceal them;
conceal your dispositions, and you will be safe
from the prying of the subtlest spies,
from the machinations of the wisest brains.
26. How victory may be produced for them out of the enemy's own tactics
that is what the multitude cannot comprehend.
27. All men can see the tactics whereby I conquer,
but what none can see is the strategy out of which victory is evolved.
28. Do not repeat the tactics which have gained you one victory,
but let your methods be regulated by the infinite variety of circumstances.

Fig. 73: Tactical Dispositions

- **Conditional Sentences**
  - Par. 21: `(Cond. => (Conseq., Adv.)) (故)` .
  - Par. 22: `(Cond. => (Conseq., Adv.)) (故)` .
  - Par. 23: `2 Adv.` .
  - Par. 24: `Cond. => Conseq.` .
  - Par. 25-28:
    `Cond. => Adv., Adv. (2 Adv.)` ,
    `2 Concl., Adv. (Adv.)(故)` .

The Way in War

In our chapter in the Handbook on the history of logic in China [69], we describe some game theoretical aspects in Sun Tzu's book. Here is an example of the *mixed game* strategy:

```
  » 28. Do not repeat the tactics which have gained you
    one victory,
    ° but let your methods be regulated by the infinite
      variety of circumstances.

29. So in war, the way is like water
  » Water avoids what is high and strikes what is low
    ° Water shapes its course according to the nature
      of the ground over which it flows.
      -  Water retains no constant shape
```

See also figures 73 and 74.

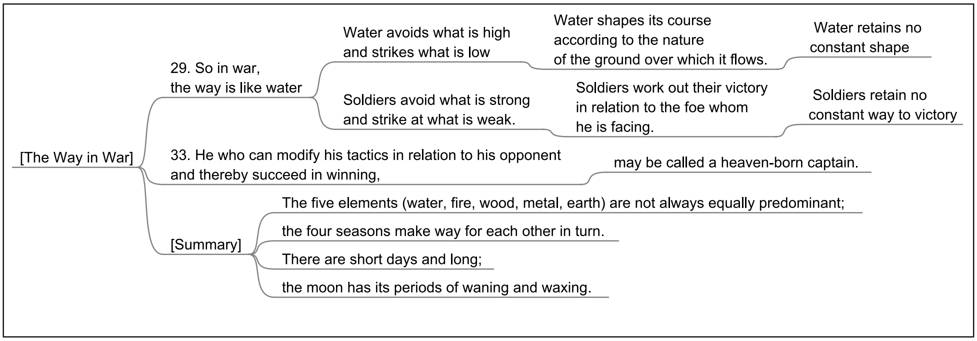

[The Way in War]
29. So in war, the way is like water
Water avoids what is high and strikes what is low
Water shapes its course according to the nature of the ground over which it flows.
Water retains no constant shape
Soldiers avoid what is strong and strike at what is weak.
Soldiers work out their victory in relation to the foe whom he is facing.
Soldiers retain no constant way to victory
33. He who can modify his tactics in relation to his opponent and thereby succeed in winning,
may be called a heaven-born captain.
[Summary]
The five elements (water, fire, wood, metal, earth) are not always equally predominant;
the four seasons make way for each other in turn.
There are short days and long;
the moon has its periods of waning and waxing.

Fig. 74: The Way in War

- **Enumerations**
  - The enumerations mentioned here are the five elements and the four seasons. The five elements in ancient China were: *water, fire, wood, metal, earth*. The four seasons known in ancient China are the same as known today.
- **Pairs of Opposites**
  - 30: **Avoid Strong and Strike Weak**.
- **Metaphors**
  - Par. 29: **Military tactics are like water**;
  - Par 34: **Five Elements, Four Seasons, Length of Day, Lunar Phases**.
- **Conditional Sentences**
  - Par. 29: `[ 2(Cond. => Adv.)] (故)` ;
    see: Circumstances, on page 223.
  - Par. 33-35: `=> Judg. (故)` ; the judgement involves several *do not*'s.
    see: Circumstances, on page 223.
  - Par. 36: `Adv. => Adv.` ;
    The advice includes a list of negative items (For example: Not to advance uphill against the enemy …).

Structured Text

VI. WEAK POINTS AND STRONG

- **1. Sun Tzu Said:**

- **Time of Attack**

```
Whoever is first in the field and awaits the coming of
the enemy,
  » will be fresh for the fight;
whoever is second in the field and has to hasten to
battle
  » will arrive exhausted.
2. Therefore the clever combatant
  » [Impose Will]
    ° imposes his will on the enemy,
    ° but does not allow the enemy's will to be imposed
      on him.
  » [Advantage and Damage]
    ° 3. By holding out advantages to him,
      -  he can cause the enemy to approach of his own
        accord;
    ° or, by inflicting damage,
      - he can make it impossible for the enemy to draw
        near.
  » 4.Therefore
    ° If the enemy is taking his ease,
      - he can harass him;
    ° if well supplied with food,
      - he can starve him out;
    ° if quietly encamped,
      - he can force him to move.
```

- **Success of Attack**

```
[Unexpected]
  » 5. Appear at points
    ° which the enemy must hasten to defend
  » march swiftly to places
    ° where you are not expected.
6. An army may march great distances without distress,
  » if it marches through country where the enemy is
    not.
[Attack and Defense]
  » 7. You can be sure of succeeding in your attacks
    ° if you only attack places which are undefended.
  » You can ensure the safety of your defense
    ° if you only hold positions that cannot be
      attacked.
  » 8. Hence
    ° that commander is skillful in attack whose
      opponent does not know what to defend;
    ° and he is skillful in defense whose opponent does
```

not know what to attack.
[Invisible and Inaudible]
» 9. O divine art of subtlety and secrecy,
° through you we learn to be invisible
° through you we learn to be inaudible;
° and hence we can hold the enemy's fate in our hands.
[Advance and Retire]
» 10. You may advance and be absolutely irresistible,
° if you make for the enemy's weak points;
» you may retire and be safe from pursuit
° if your movements are more rapid than those of the enemy.

- **Fighting**

11. If we wish to fight,
» the enemy can be forced to an engagement
° even though he be sheltered behind a high rampart and a deep ditch.
» All we need do is attack some other place that he will be obliged to relieve.
12. If we do not wish to fight,
» we can prevent the enemy from engaging us
° even though the lines of our encampment be merely traced out on the ground.
» All we need do is to throw something odd and unaccountable in his way.
13. By discovering the enemy's dispositions and remaining invisible ourselves,
» we can keep our forces concentrated,
° while the enemy's must be divided.
» We can form a single united body,
° while the enemy must split up into fractions.
» Hence there will be a whole pitted against separate parts of a whole,
° which means that we shall be many to the enemy's few.
15. And if we are able thus to attack an inferior force with a superior one,
» our opponents will be in dire straits.

- **Place of Attack**

16. The spot where we intend to fight must not be made known;
» then the enemy will have to prepare against a possible attack at several different points;
» and his forces being thus distributed in many directions,
» the numbers we shall have to face at any given point will be proportionately few.
[Therefore]
» 17. Should the enemy strengthen his front,
° he will weaken his rear;
» Should he strengthen his rear,

  - he will weaken his front;
- Should he strengthen his left,
  - he will weaken his right;
- Should he strengthen his right,
  - he will weaken his left.
- If he sends reinforcements everywhere,
  - he will everywhere be weak.

[Number]

- 18. Numerical weakness comes
  - from having to prepare against possible attacks;
- numerical strength,
  - from compelling our adversary to make these preparations against us.

[Knowledge]

- 19. Knowing the place and the time of the coming battle,
  - we may concentrate from the greatest distances in order to fight.
- 20. But if neither time nor place be known,
  - then the left wing will be impotent to succor the right,
  - the right equally impotent to succor the left,
  - the front unable to relieve the rear,
  - or the rear to support the front.
  - How much more so if the furthest portions of the army are anything under a hundred LI apart, and even the nearest are separated by several LI!

- **Tactical Dispositions**

21. Though according to my estimate the soldiers of Yueh exceed our own in number,
  - that shall advantage them nothing in the matter of victory.
  - I say then that victory can be achieved.
22. Though the enemy be stronger in numbers,
  - we may prevent him from fighting.
  - Scheme so as to discover his plans and the likelihood of their success.

[Learn]

- 23. Rouse him, and learn the principle of his activity or inactivity.
- Force him to reveal himself, so as to find out his vulnerable spots.

24. Carefully compare the opposing army with your own,
  - so that you may know where strength is superabundant and where it is deficient.
25. In making tactical dispositions,
  - the highest pitch you can attain is to conceal them;
  - conceal your dispositions, and you will be safe
    - from the prying of the subtlest spies,
    - from the machinations of the wisest brains.
  - 26. How victory may be produced for them out of the enemy's own tactics

    - ° that is what the multitude cannot comprehend.
  - » 27. All men can see the tactics whereby I conquer,
    - ° but what none can see is the strategy out of which victory is evolved.
  - » 28. Do not repeat the tactics which have gained you one victory,
    - ° but let your methods be regulated by the infinite variety of circumstances.

- **The Way in War**

29. So in war, the way is like water
  - » Water avoids what is high and strikes what is low
    - ° Water shapes its course according to the nature of the ground over which it flows.
      - - Water retains no constant shape
  - » Soldiers avoid what is strong and strike at what is weak.
    - ° Soldiers work out their victory in relation to the foe whom he is facing.
      - - Soldiers retain no constant way to victory

33. He who can modify his tactics in relation to his opponent and thereby succeed in winning,
  - » may be called a heaven-born captain.

[Summary]
  - » The five elements (water, fire, wood, metal, earth) are not always equally predominant;
  - » the four seasons make way for each other in turn.
  - » There are short days and long;
  - » the moon has its periods of waning and waxing.

VII. CONTENDING - 軍爭

Abstract The first part of this chapter talks about maneuvering, the second part of the chapter talks about circumstances of various kinds. This chapter has an abundance of conditional patterns, such as implications with 故.

Zhuge Liang seizing Chen Cang with a special force.

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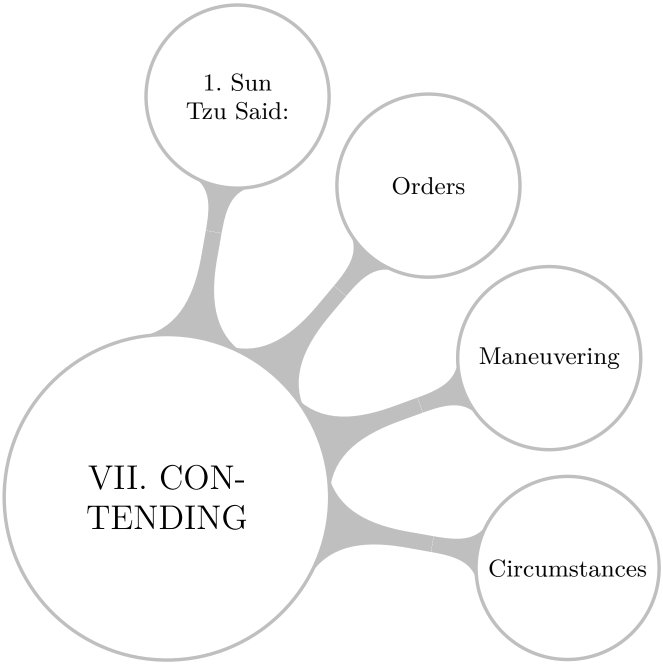
P. van Emde Boas et al., *Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps*, Logic in Asia: Studia Logica Library,
https://doi.org/10.1007/978-981-19-6250-9_17

Main Concepts



The first part of this chapter talks about maneuvering. After having assembled the army, nothing is more difficult than maneuvering. Maneuvering means moving the army or parts of it and Sun Tzu explains what can happen if you move a too large part of the army, or move too fast, and what happens if the terrain is not taken into account.

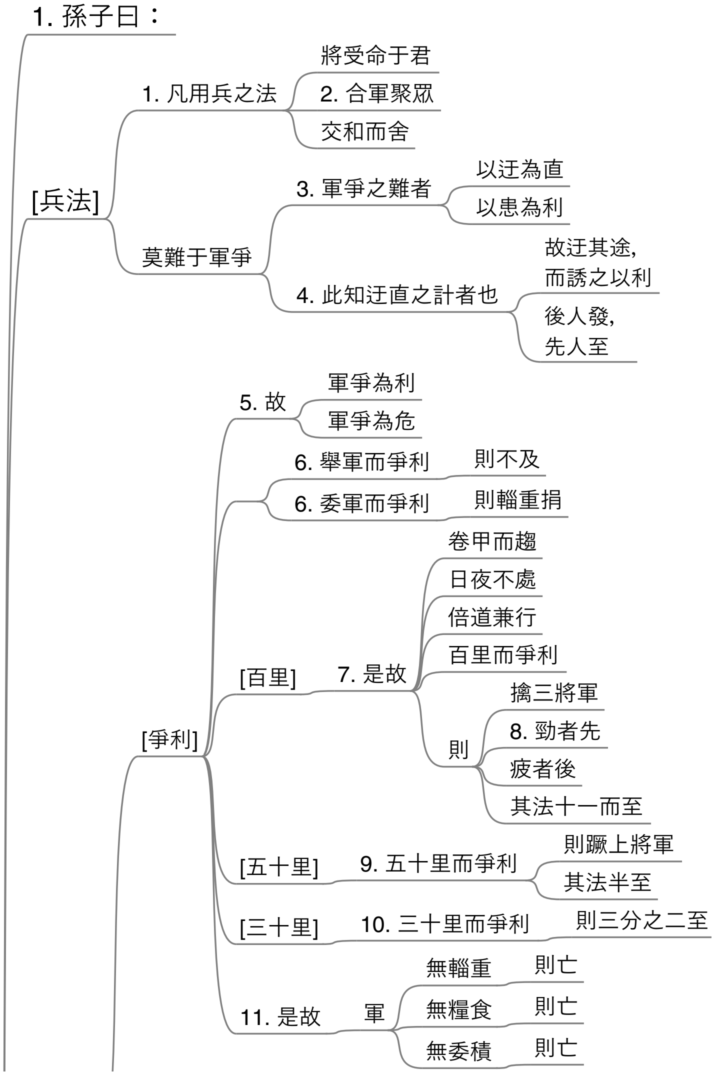
The second part of the chapter talks about circumstances and mentions a lost book, *The book of Army Management*, which handles various kinds of military rules.

The last sentence in this chapter contains interesting text: *When you surround an army, leave an outlet free. Do not press a desperate foe too hard.*

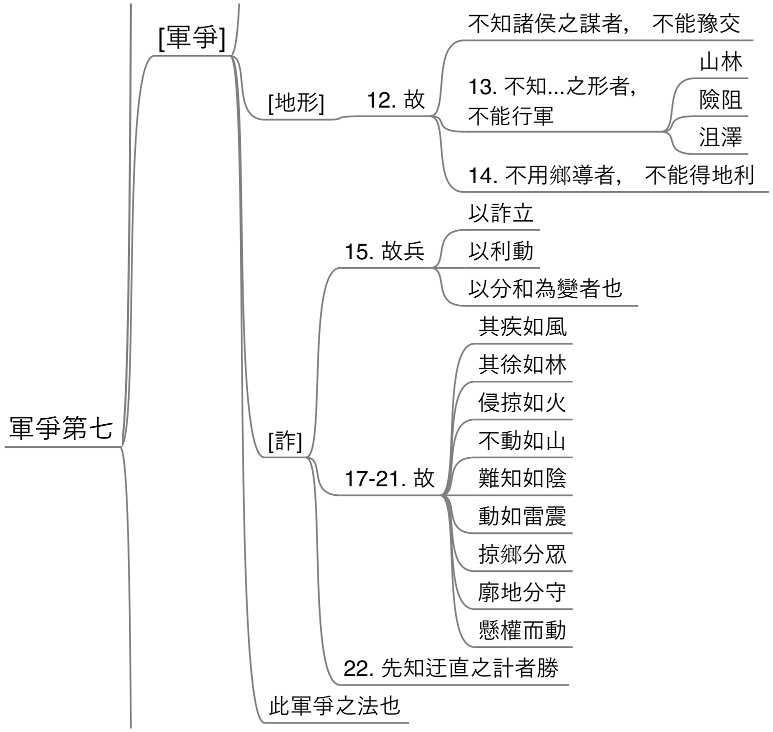
A note about translation: The Giles text translates the title of this chapter as: *Maneuvering.* This covers only the first part of the chapter, therefore a better title is: *Contending.*

Mind Maps

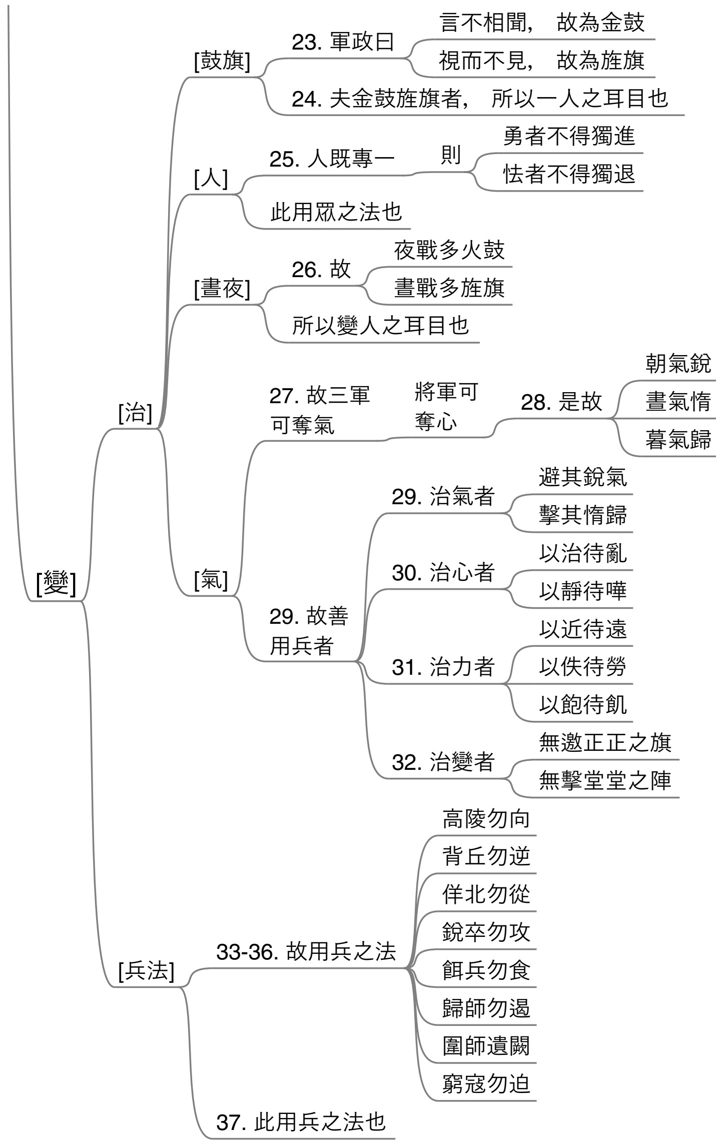
The overview for this chapter can be found in mind map figures 29 to 35.


1. 孫子曰：
[兵法]
1. 凡用兵之法
將受命于君
2. 合軍聚眾
交和而舍
莫難于軍爭
3. 軍爭之難者
以迂為直
以患為利
4. 此知迂直之計者也
故迂其途,
而誘之以利
後人發,
先人至
[爭利]
5. 故
軍爭為利
軍爭為危
6. 舉軍而爭利
則不及
6. 委軍而爭利
則輜重捐
[百里]
7. 是故
卷甲而趨
日夜不處
倍道兼行
百里而爭利
則
擒三將軍
8. 勁者先
疲者後
其法十一而至
[五十里]
9. 五十里而爭利
則蹶上將軍
其法半至
[三十里]
10. 三十里而爭利
則三分之二至
11. 是故
軍
無輜重
則亡
無糧食
則亡
無委積
則亡

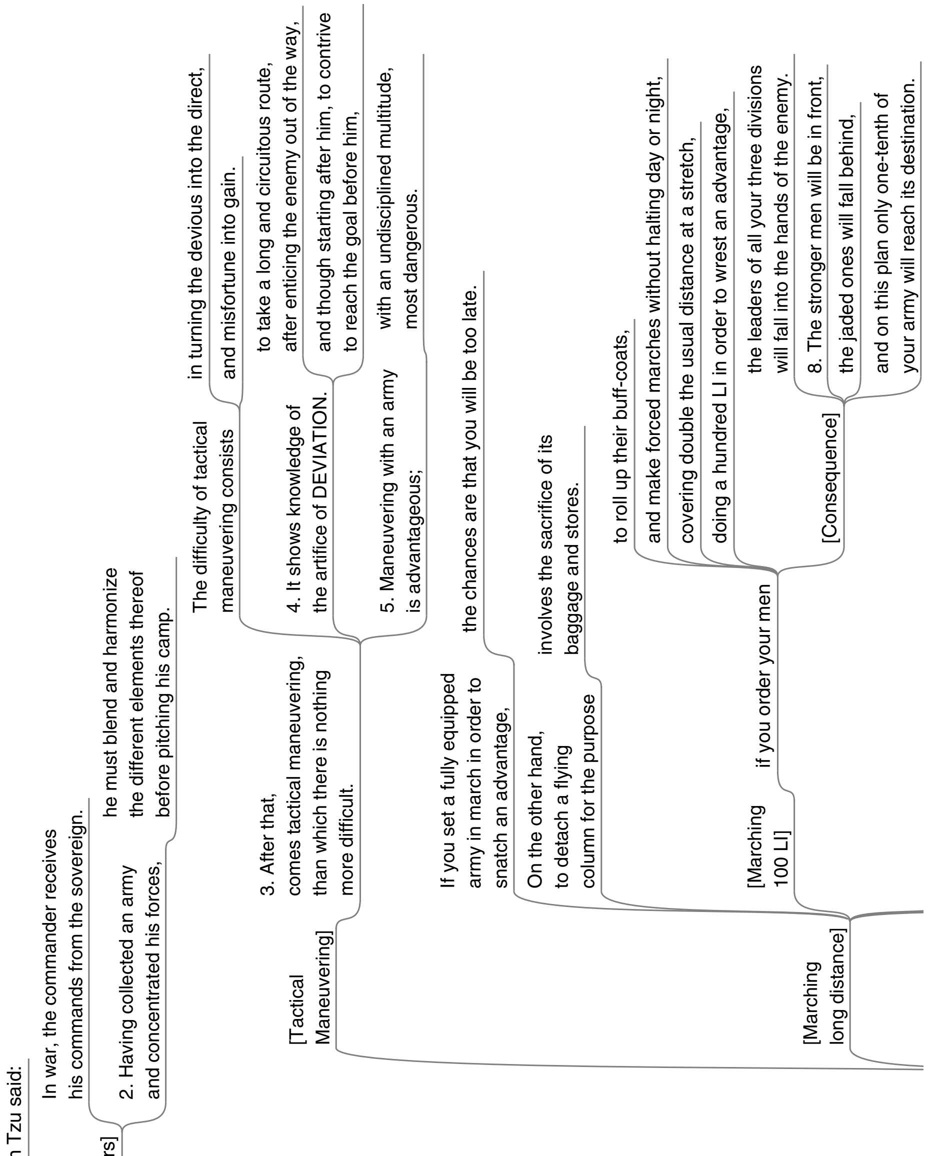
Mind Map 29: Aow Ch. VII, Chinese Mind Map - Part 1


軍爭第七
[軍爭]
[地形]
12. 故
不知諸侯之謀者，不能豫交
13. 不知...之形者，
不能行軍
山林
險阻
沮澤
14. 不用鄉導者，不能得地利
[詐]
15. 故兵
以詐立
以利動
以分和為變者也
17-21. 故
其疾如風
其徐如林
侵掠如火
不動如山
難知如陰
動如雷震
掠鄉分眾
廓地分守
懸權而動
22. 先知迂直之計者勝
此軍爭之法也

Mind Map 30: Aow Ch. VII, Chinese Mind Map - Part 2

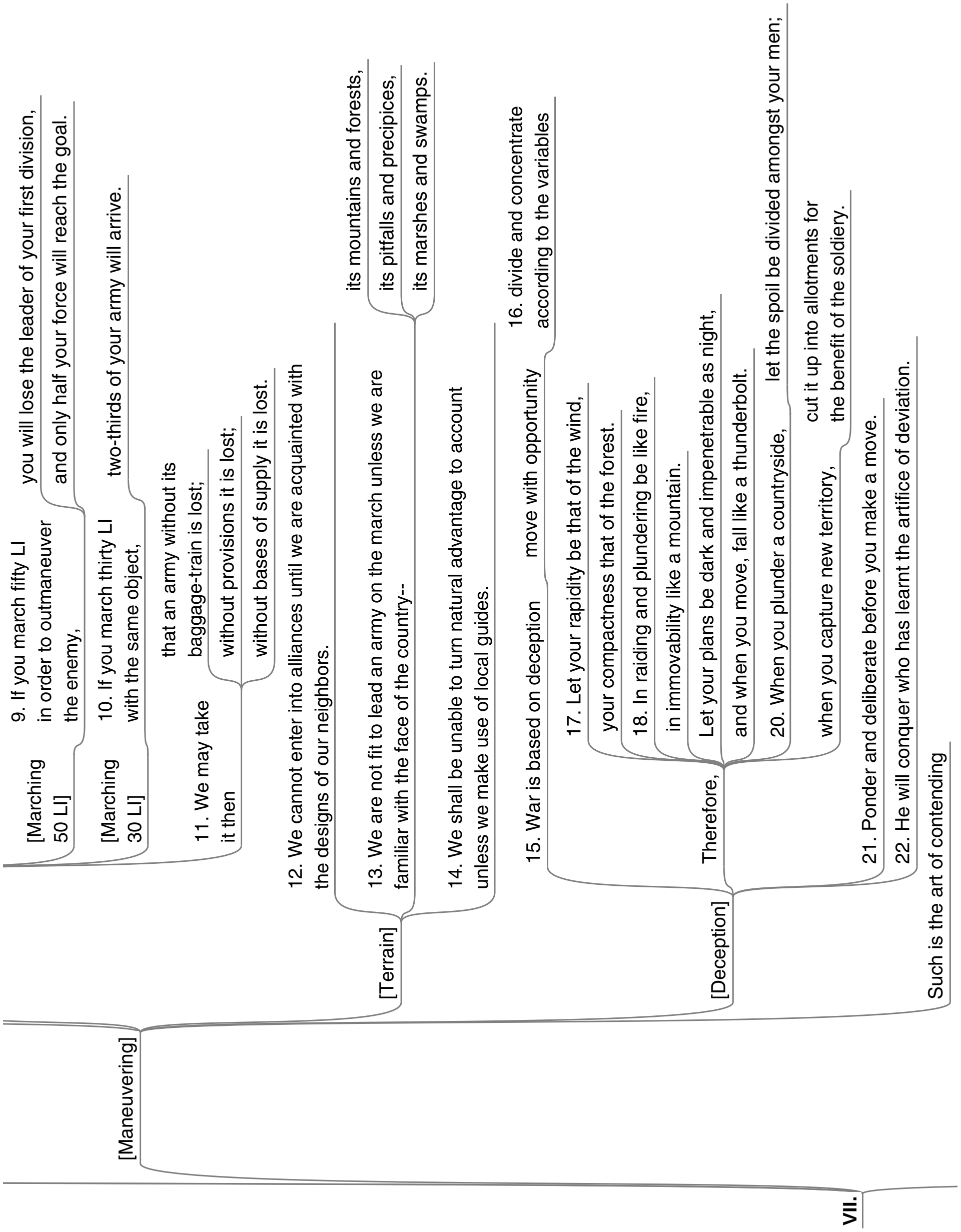

[變]
[治]
[鼓旗]
23. 軍政曰
言不相聞， 故為金鼓
視而不見， 故為旌旗
24. 夫金鼓旌旗者， 所以一人之耳目也
[人]
25. 人既專一
則
勇者不得獨進
怯者不得獨退
此用眾之法也
[晝夜]
26. 故
夜戰多火鼓
晝戰多旌旗
所以變人之耳目也
[氣]
27. 故三軍
可奪氣
將軍可
奪心
28. 是故
朝氣銳
晝氣惰
暮氣歸
29. 故善
用兵者
29. 治氣者
避其銳氣
擊其惰歸
30. 治心者
以治待亂
以靜待譁
31. 治力者
以近待遠
以佚待勞
以飽待飢
32. 治變者
無邀正正之旗
無擊堂堂之陣
[兵法]
33-36. 故用兵之法
高陵勿向
背丘勿逆
佯北勿從
銳卒勿攻
餌兵勿食
歸師勿遏
圍師遺闕
窮寇勿迫
37. 此用兵之法也

Mind Map 31: Aow Ch. VII, Chinese Mind Map - Part 3

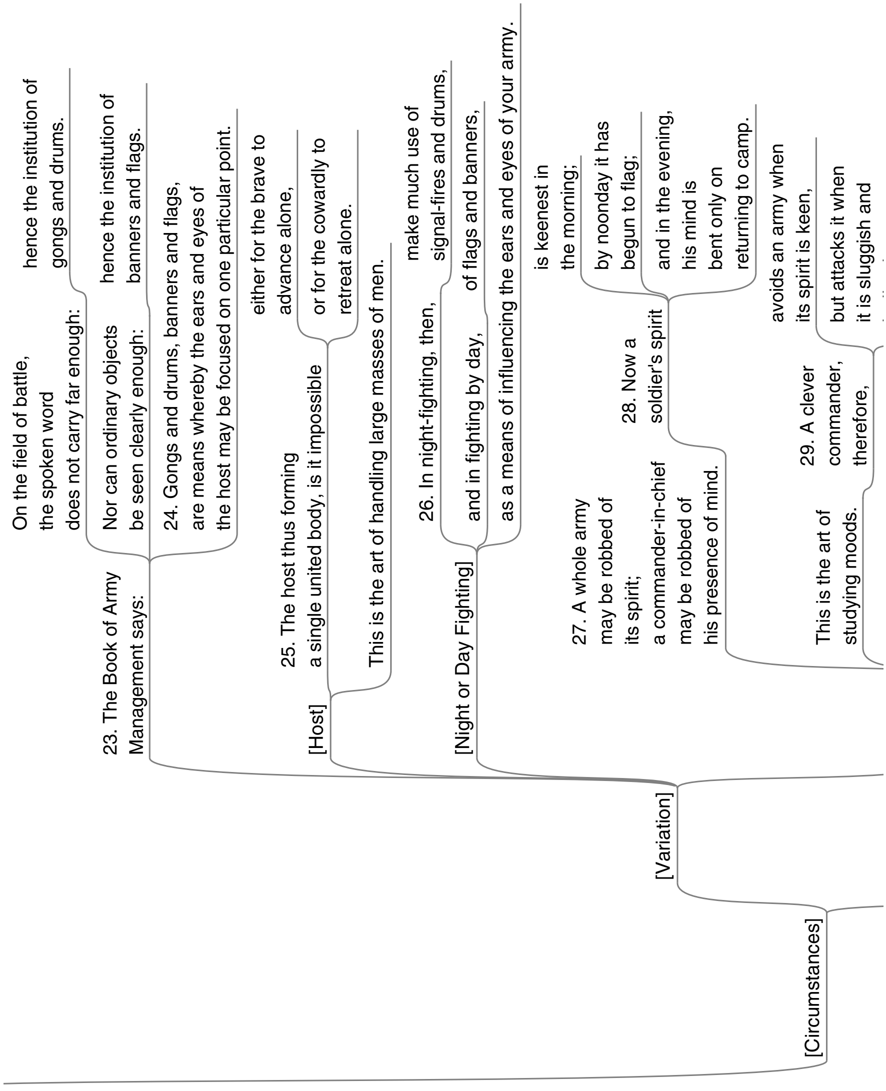


- 1. Sun Tzu said:
- [Orders]
  - In war, the commander receives his commands from the sovereign.
  - 2. Having collected an army and concentrated his forces,
    - he must blend and harmonize the different elements thereof before pitching his camp.
- [Tactical Maneuvering]
  - 3. After that, comes tactical maneuvering, than which there is nothing more difficult.
    - The difficulty of tactical maneuvering consists
      - in turning the devious into the direct,
      - and misfortune into gain.
    - 4. It shows knowledge of the artifice of DEVIATION.
      - to take a long and circuitous route, after enticing the enemy out of the way,
      - and though starting after him, to contrive to reach the goal before him,
    - 5. Maneuvering with an army is advantageous;
      - with an undisciplined multitude, most dangerous.
- [Marching long distance]
  - If you set a fully equipped army in march in order to snatch an advantage,
    - the chances are that you will be too late.
  - On the other hand, to detach a flying column for the purpose
    - involves the sacrifice of its baggage and stores.
  - [Marching 100 LI]
    - if you order your men
      - to roll up their buff-coats,
      - and make forced marches without halting day or night,
      - covering double the usual distance at a stretch,
      - doing a hundred LI in order to wrest an advantage,
      - the leaders of all your three divisions will fall into the hands of the enemy.
      - [Consequence]
        - 8. The stronger men will be in front,
        - the jaded ones will fall behind,
        - and on this plan only one-tenth of your army will reach its destination.

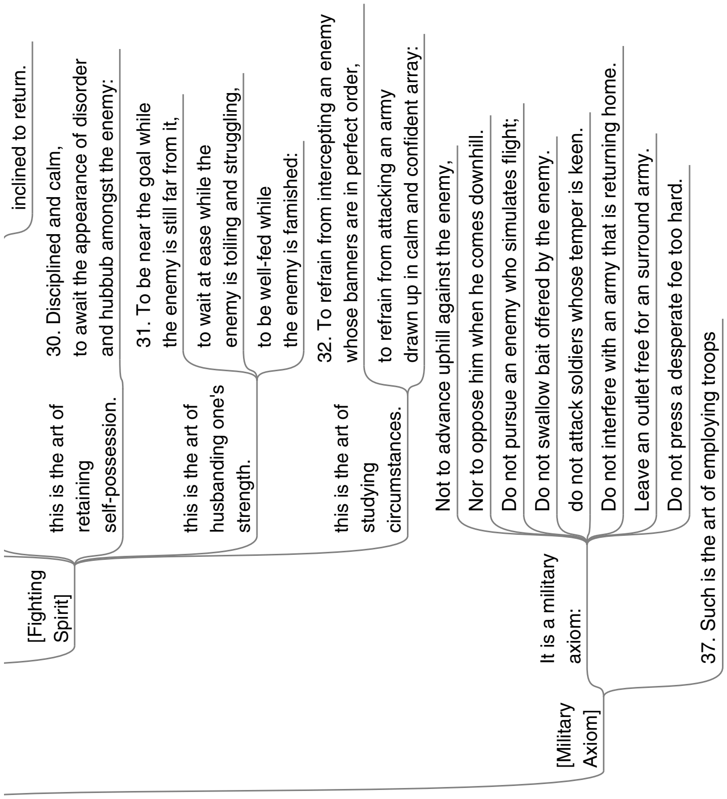
Mind Map 32: Aow Ch. VII - CONTENDING - Part 1


VII.
[Maneuvering]
[Marching 50 LI]
9. If you march fifty LI in order to outmaneuver the enemy,
you will lose the leader of your first division,
and only half your force will reach the goal.
[Marching 30 LI]
10. If you march thirty LI with the same object,
two-thirds of your army will arrive.
11. We may take it then
that an army without its baggage-train is lost;
without provisions it is lost;
without bases of supply it is lost.
[Terrain]
12. We cannot enter into alliances until we are acquainted with the designs of our neighbors.
13. We are not fit to lead an army on the march unless we are familiar with the face of the country--
its mountains and forests,
its pitfalls and precipices,
its marshes and swamps.
14. We shall be unable to turn natural advantage to account unless we make use of local guides.
[Deception]
15. War is based on deception
move with opportunity
16. divide and concentrate according to the variables
Therefore,
17. Let your rapidity be that of the wind,
your compactness that of the forest.
18. In raiding and plundering be like fire,
in immovability like a mountain.
Let your plans be dark and impenetrable as night,
and when you move, fall like a thunderbolt.
20. When you plunder a countryside,
let the spoil be divided amongst your men;
when you capture new territory,
cut it up into allotments for the benefit of the soldiery.
21. Ponder and deliberate before you make a move.
22. He will conquer who has learnt the artifice of deviation.
Such is the art of contending

Mind Map 33: Aow Ch. VII - CONTENDING - Part 2


[Circumstances]
[Variation]
23. The Book of Army Management says:
On the field of battle, the spoken word does not carry far enough:
hence the institution of gongs and drums.
Nor can ordinary objects be seen clearly enough:
hence the institution of banners and flags.
24. Gongs and drums, banners and flags, are means whereby the ears and eyes of the host may be focused on one particular point.
[Host]
25. The host thus forming a single united body, is it impossible
either for the brave to advance alone,
or for the cowardly to retreat alone.
This is the art of handling large masses of men.
[Night or Day Fighting]
26. In night-fighting, then,
make much use of signal-fires and drums,
and in fighting by day,
of flags and banners,
as a means of influencing the ears and eyes of your army.
27. A whole army may be robbed of its spirit;
a commander-in-chief may be robbed of his presence of mind.
28. Now a soldier's spirit
is keenest in the morning;
by noonday it has begun to flag;
and in the evening, his mind is bent only on returning to camp.
29. A clever commander, therefore,
avoids an army when its spirit is keen,
but attacks it when it is sluggish and
This is the art of studying moods.

Mind Map 34: Aow Ch. VII - CONTENDING - Part 3


inclined to return.
[Fighting Spirit]
this is the art of retaining self-possession.
30. Disciplined and calm, to await the appearance of disorder and hubbub amongst the enemy:
this is the art of husbanding one's strength.
31. To be near the goal while the enemy is still far from it,
to wait at ease while the enemy is toiling and struggling,
to be well-fed while the enemy is famished:
this is the art of studying circumstances.
32. To refrain from intercepting an enemy whose banners are in perfect order,
to refrain from attacking an army drawn up in calm and confident array:
[Military Axiom]
It is a military axiom:
Not to advance uphill against the enemy,
Nor to oppose him when he comes downhill.
Do not pursue an enemy who simulates flight;
Do not swallow bait offered by the enemy.
do not attack soldiers whose temper is keen.
Do not interfere with an army that is returning home.
Leave an outlet free for an surround army.
Do not press a desperate foe too hard.
37. Such is the art of employing troops

Mind Map 35: Aow Ch. VII - CONTENDING - Part 4

Details and Patterns

As noted in the overview for this chapter, the Giles text translates the title of this chapter as: *Maneuvering*. This covers only the first part of the chapter, therefore a better title is: *Contending*.

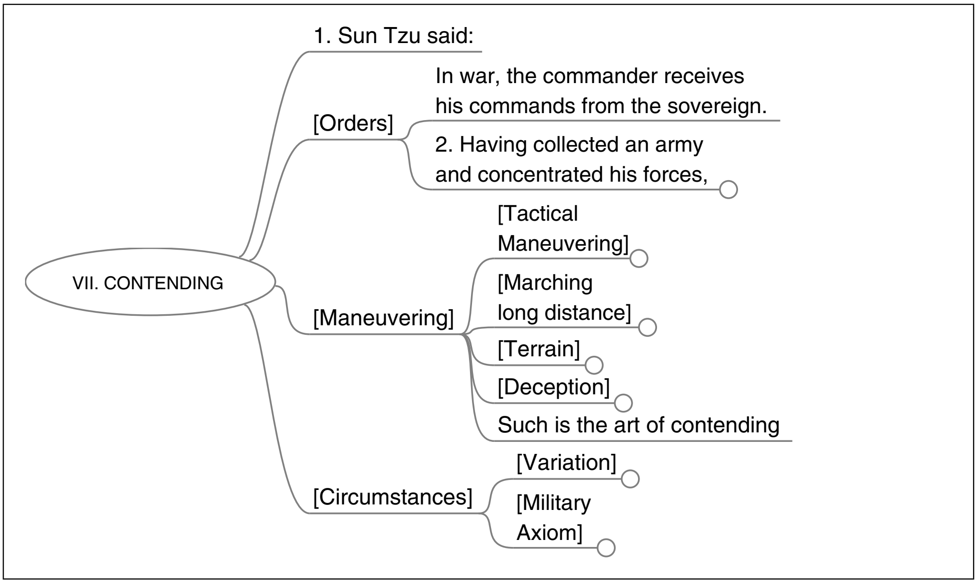

VII. CONTENDING
1. Sun Tzu said:
[Orders]
In war, the commander receives his commands from the sovereign.
2. Having collected an army and concentrated his forces,
[Maneuvering]
[Tactical Maneuvering]
[Marching long distance]
[Terrain]
[Deception]
Such is the art of contending
[Circumstances]
[Variation]
[Military Axiom]

Fig. 75: AoW Ch.VII - Mind Map Overview

Sun Tzu Said:

This chapter has an abundance of *Conditional Sentence with* 故 patterns. Together with chapter VI it has the largest number of 故 (gu, therefore) characters, both chapters have 14 occurrences, which are an indication for an Conditional Sentence in the text. There are 11 occurrences of 而 (ér, indicating a causal relation, change of state or contrast).

Orders

This is an introductory sentence stating the hierarchy of command:

> A general receives his order from the sovereign.

- **Conditional Sentences** in *Orders*
  - Par. 1: `Universal quantification 凡, Judge.`

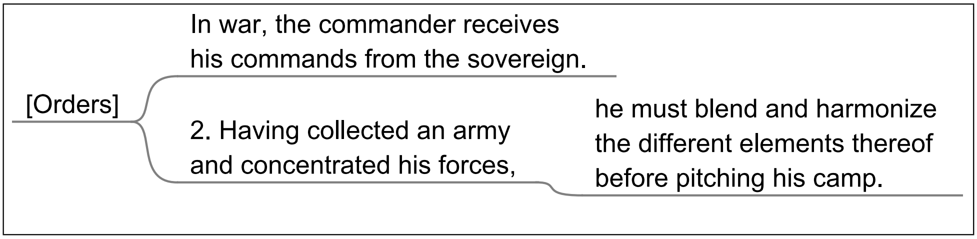

[Orders]
In war, the commander receives his commands from the sovereign.
2. Having collected an army and concentrated his forces,
he must blend and harmonize the different elements thereof before pitching his camp.

Fig. 76: Orders

- Par. 2: `2. Having collected an army…`
  `Cond. => Adv.` .
  As an Conditional Sentence, this sentence is weak, although there is clearly an assumption that first the army must be collected, and subsequently the commander can blend and harmonize the elements.

Maneuvering

This section talks about *maneuvering*. It has several aspects that are addressed: *Tactical Maneuvering, Marching long distance, Terrain* and *Deception*. This can be seen as an informal enumeration.

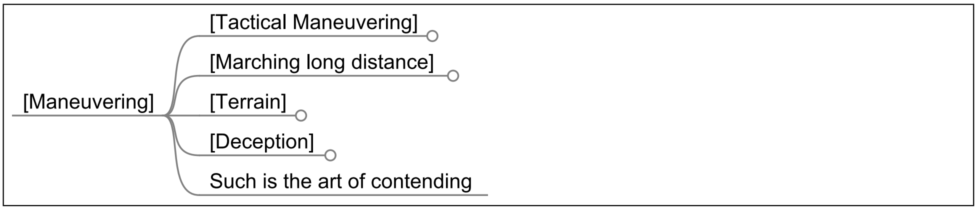

[Maneuvering]
[Tactical Maneuvering]
[Marching long distance]
[Terrain]
[Deception]
Such is the art of contending

Fig. 77: Maneuvering

- **Pairs of Opposites** in *Maneuvering*, see figure: 78.
  - Par. 3: The difficulty of tactical maneuvering consists in turning the *devious* into the *direct*, and *misfortune* into *gain*.

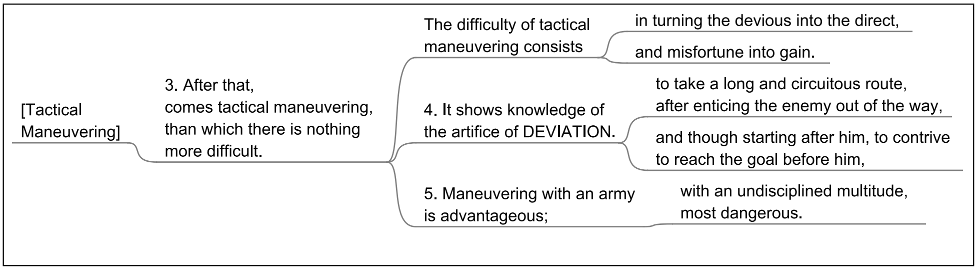

[Tactical Maneuvering]
3. After that, comes tactical maneuvering, than which there is nothing more difficult.
The difficulty of tactical maneuvering consists
in turning the devious into the direct,
and misfortune into gain.
4. It shows knowledge of the artifice of DEVIATION.
to take a long and circuitous route, after enticing the enemy out of the way,
and though starting after him, to contrive to reach the goal before him,
5. Maneuvering with an army is advantageous;
with an undisciplined multitude, most dangerous.

Fig. 78: Tactical Maneuvering

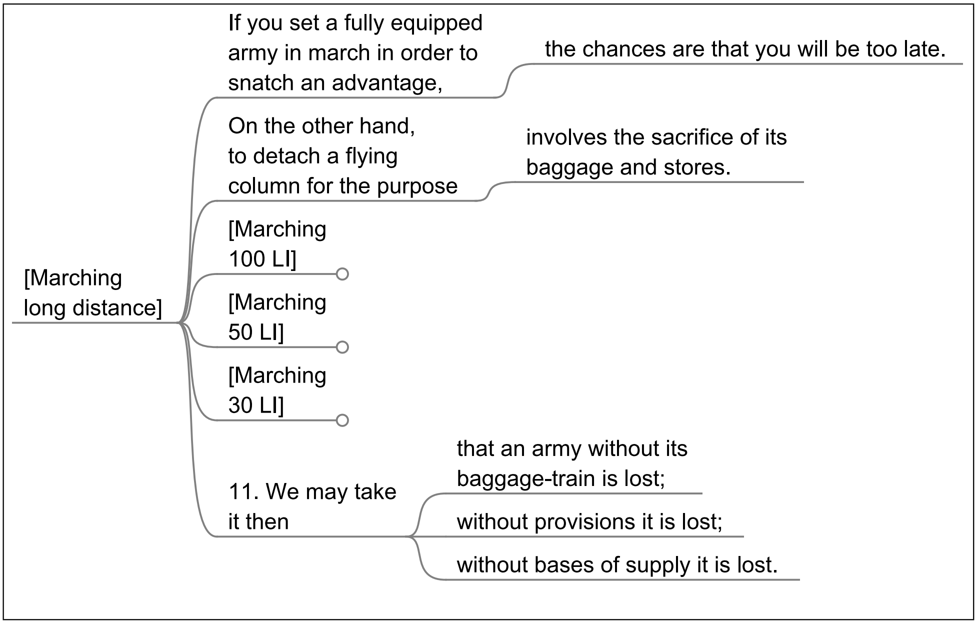

[Marching long distance]
If you set a fully equipped army in march in order to snatch an advantage,
the chances are that you will be too late.
On the other hand, to detach a flying column for the purpose
involves the sacrifice of its baggage and stores.
[Marching 100 LI]
[Marching 50 LI]
[Marching 30 LI]
11. We may take it then
that an army without its baggage-train is lost;
without provisions it is lost;
without bases of supply it is lost.

Fig. 79: Marching Long Distance

- **Conditional Sentence** in *Marching Long Distance*
  - Par. 6: `If you set a fully equipped army…`

    `2 (Cond.. => Conseq.)`

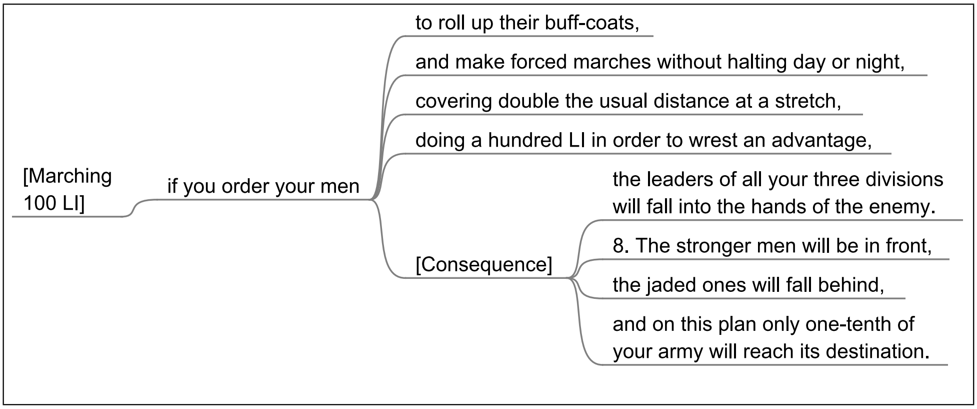

[Marching 100 LI]
if you order your men
to roll up their buff-coats,
and make forced marches without halting day or night,
covering double the usual distance at a stretch,
doing a hundred LI in order to wrest an advantage,
[Consequence]
the leaders of all your three divisions will fall into the hands of the enemy.
8. The stronger men will be in front,
the jaded ones will fall behind,
and on this plan only one-tenth of your army will reach its destination.

Fig. 80: ch07-Marching 100 LI-cropped

- **Conditional Sentence** in *Marching 100 LI*
  - Par. 7-8: `if you order your men…`

    `(4 Cond. => 4 Conseq.) (故)`

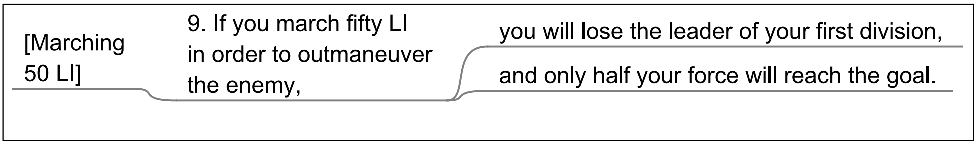

[Marching 50 LI]
9. If you march fifty LI in order to outmaneuver the enemy,
you will lose the leader of your first division,
and only half your force will reach the goal.

Fig. 81: ch07-Marching 50 LI-cropped

- **Conditional Sentence** in *Marching 50 LI*
  - Par. 9: `If you march fifty LI…`
    `Cond. => 2 Conseq.`

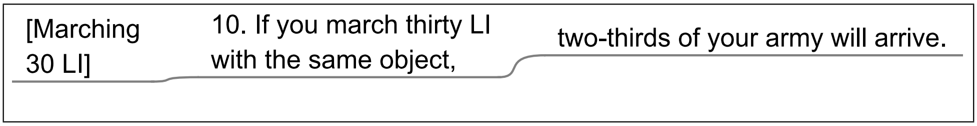

[Marching 30 LI]
10. If you march thirty LI with the same object,
two-thirds of your army will arrive.

Fig. 82: Marching 30 LI

- **Conditional Sentences** in *Marching 30 LI*
  - Par. 10: `If you march thirty LI …`
    `Cond. => Conseq.`
  - Par. 11: `We may take it then…`, see figure 79. This paragraph refers back to *Marching long distance* in general.
    `Judge. (故)`

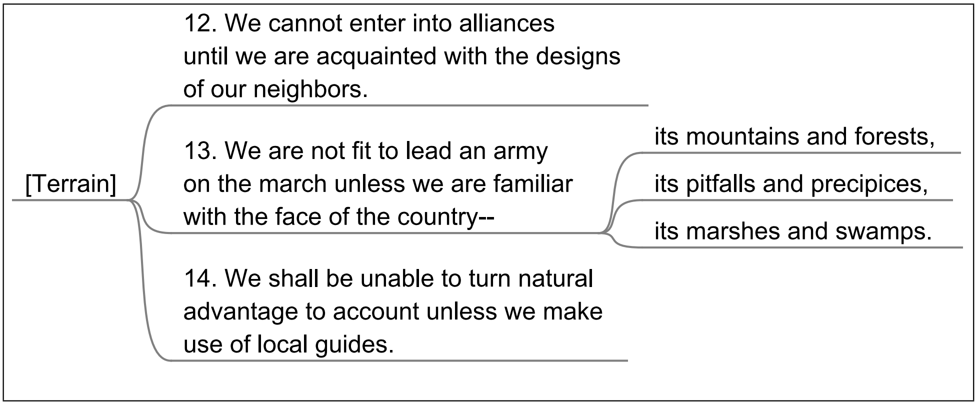

[Terrain]
12. We cannot enter into alliances until we are acquainted with the designs of our neighbors.
13. We are not fit to lead an army on the march unless we are familiar with the face of the country--
its mountains and forests,
its pitfalls and precipices,
its marshes and swamps.
14. We shall be unable to turn natural advantage to account unless we make use of local guides.

Fig. 83: ch07-Terrain

- **Conditional Sentences** in *Terrain*
  - Par. 12: `We cannot enter into alliances…`
    `Conseq. <= Cond.; (故)` . This is a reversed condition.
  - Par. 13: `We are not fit to lead an army…`
    `Conseq. <= Complex Cond.` ;. This is a reversed condition.

- Par. 14: `We shall be unable to turn natural advantage...`
  `Conseq. <= Cond.` . This is a reversed condition.

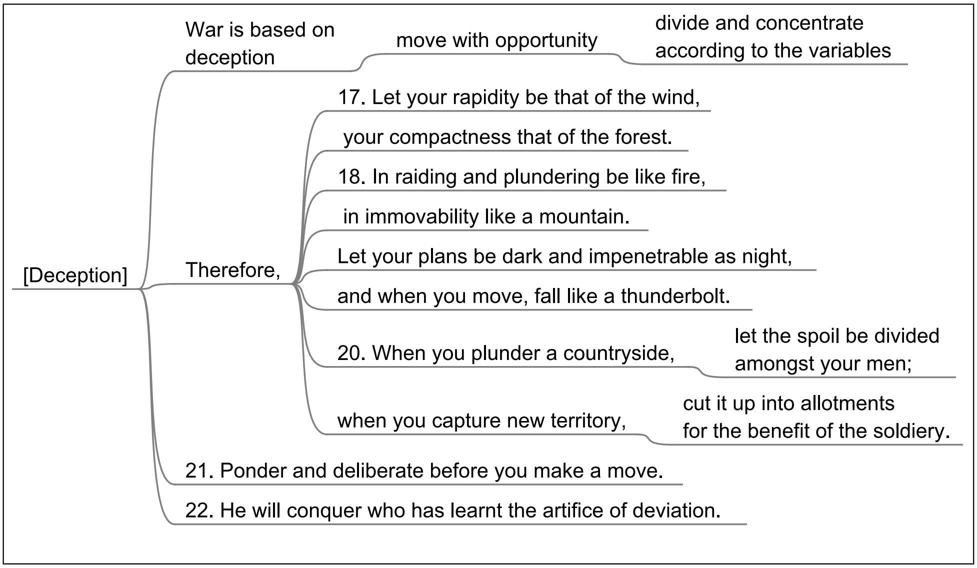

[Deception]
War is based on deception
move with opportunity
divide and concentrate according to the variables
Therefore,
17. Let your rapidity be that of the wind,
your compactness that of the forest.
18. In raiding and plundering be like fire,
in immovability like a mountain.
Let your plans be dark and impenetrable as night,
and when you move, fall like a thunderbolt.
20. When you plunder a countryside,
let the spoil be divided amongst your men;
when you capture new territory,
cut it up into allotments for the benefit of the soldiery.
21. Ponder and deliberate before you make a move.
22. He will conquer who has learnt the artifice of deviation.

Fig. 84: ch07-Deception

The original translation by Giles of paragraph 16 in the section about *deception*, see figure 84, is as follows:

> Whether to *concentrate* or to *divide* your troops, must be decided by circumstances.

We modified the Giles translation slightly, switching concentrate and divide, following the Chinese more closely. See also the translation by Zieger [82].

```
» 15. War is based on deception
  ° move with opportunity
    - 16. divide and concentrate according to the
      variables
» Therefore,
  ...
```

The patterns found in the section *Deception* are:

- **Pair of Opposites**
  - par. 16: *Divide* and *Concentrate.*
- **Metaphors**
  - par: 17-19: *Wind, Forest, Fire, Mountain, Night, Thunderbolt.*

- **Conditional Sentences** in *Deception*
  - Par. 15: `War is based on deception...`
    `=> Judge., Adv.` (故)

- Par. 16: `divide and concentrate…`
  `Cond. => Adv.` 也 indicates a reversed implication
- Par. 17: `Let your rapidity be…`
  `=> Judge. (故)`
- Par. 20-21: `When you plunder…`
  `3 (Cond. => Adv.)`
- Par. 22: `He will conquer…`
  `Cond. <= Conseq.` ; 也 indicates the essence of the sentence, and the implication is reversed.

Circumstances

For the subject of *Circumstances* there are two parts: *Variation* and *Military Axiom.*

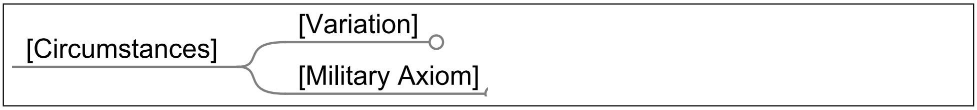

[Circumstances]
[Variation]
[Military Axiom]

Fig. 85: Circumstances

Variation

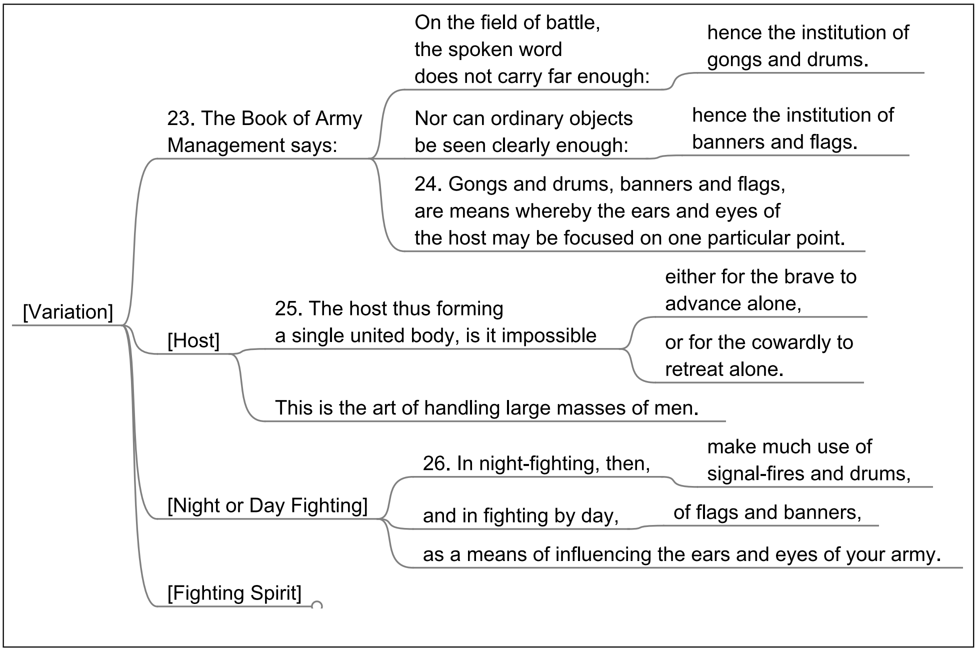

[Variation]
23. The Book of Army Management says:
On the field of battle, the spoken word does not carry far enough:
hence the institution of gongs and drums.
Nor can ordinary objects be seen clearly enough:
hence the institution of banners and flags.
24. Gongs and drums, banners and flags, are means whereby the ears and eyes of the host may be focused on one particular point.
[Host]
25. The host thus forming a single united body, is it impossible
either for the brave to advance alone,
or for the cowardly to retreat alone.
This is the art of handling large masses of men.
[Night or Day Fighting]
26. In night-fighting, then,
make much use of signal-fires and drums,
and in fighting by day,
of flags and banners,
as a means of influencing the ears and eyes of your army.
[Fighting Spirit]

Fig. 86: Variation

- **Conditional Sentences** in *Variation*
  - Par. 23: `The Book of Army Management…` `2 (Adv. => Adv. (故))`
  - Par. 26: `In night-fighting, then,…` `2(Cond. => Adv.) (故)`;
  - Par. 27: `A whole army may be robbed…` `=> Judge. (故)`
  - Par. 28: `Now a soldier's spirit…` `=> 3 Jud (故)`
  - Par. 29: `A clever commander, therefore,…` `2(Cond. => Adv.) (故)`
  - Par. 33-36: `It is a military axiom…` `8 (Cond. => Adv.) (故)`; the judgement involves three *do not* advices.

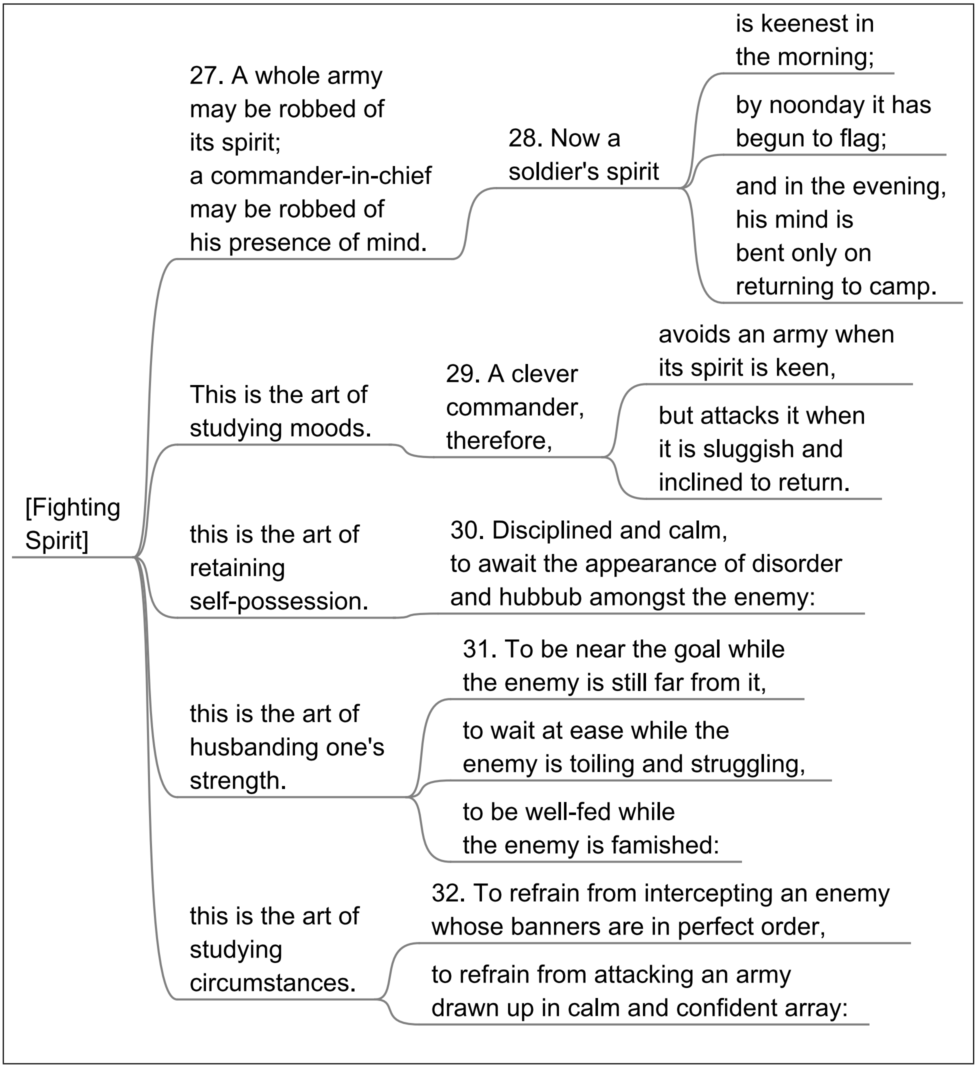

[Fighting Spirit]
27. A whole army may be robbed of its spirit; a commander-in-chief may be robbed of his presence of mind.
28. Now a soldier's spirit
is keenest in the morning;
by noonday it has begun to flag;
and in the evening, his mind is bent only on returning to camp.
This is the art of studying moods.
29. A clever commander, therefore,
avoids an army when its spirit is keen,
but attacks it when it is sluggish and inclined to return.
this is the art of retaining self-possession.
30. Disciplined and calm, to await the appearance of disorder and hubbub amongst the enemy:
this is the art of husbanding one's strength.
31. To be near the goal while the enemy is still far from it,
to wait at ease while the enemy is toiling and struggling,
to be well-fed while the enemy is famished:
this is the art of studying circumstances.
32. To refrain from intercepting an enemy whose banners are in perfect order,
to refrain from attacking an army drawn up in calm and confident array:

Fig. 87: Fighting Spirit

The **pairs of opposites** in the section *Variation* are:

- 25: *The brave or the cowardly.*
- 29: *Keen or sluggish.*
- 31: *Near* the goal, or *far* from it, *at ease* or *toiling and struggling*, *well-fed or famished.*

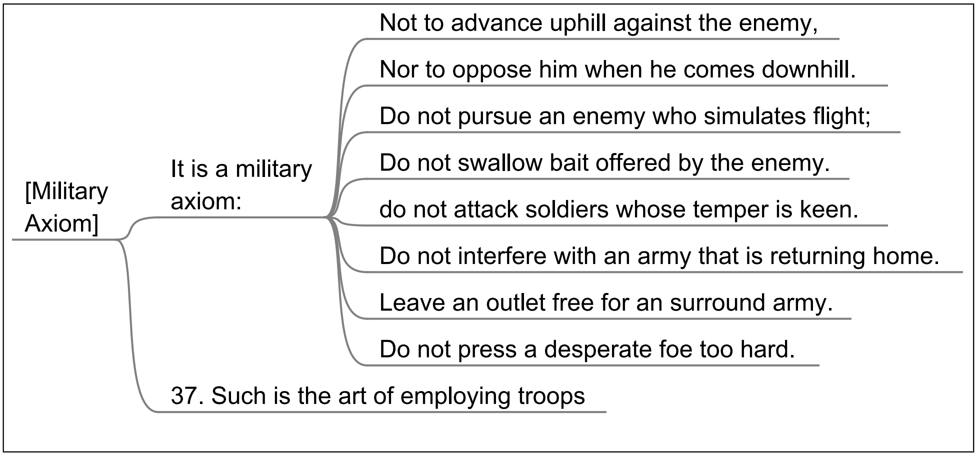

[Military Axiom]
It is a military axiom:
Not to advance uphill against the enemy,
Nor to oppose him when he comes downhill.
Do not pursue an enemy who simulates flight;
Do not swallow bait offered by the enemy.
do not attack soldiers whose temper is keen.
Do not interfere with an army that is returning home.
Leave an outlet free for an surround army.
Do not press a desperate foe too hard.
37. Such is the art of employing troops

Fig. 88: Military Axiom

- The **pairs of opposites** in the section *Military Axiom* are:
  - 33: *uphill, or downhill.*
- **Conditional Sentence** with 故 pattern in *Military Axiom*
  - 33. It is a military axiom....

Structured Text

VII. CONTENDING

- **1. Sun Tzu Said:**

- **Orders**

  In war, the commander receives his commands from the sovereign.
  2. Having collected an army and concentrated his forces,
    - » he must blend and harmonize the different elements thereof before pitching his camp.

- **Maneuvering**

  [Tactical Maneuvering]
  - » 3. After that, comes tactical maneuvering, than which there is nothing more difficult.
    - ° The difficulty of tactical maneuvering consists
      - in turning the devious into the direct,
      - and misfortune into gain.
    - ° 4. It shows knowledge of the artifice of DEVIATION.
      - to take a long and circuitous route, after enticing the enemy out of the way,
      - and though starting after him, to contrive to reach the goal before him,
    - ° 5. Maneuvering with an army is advantageous;
      - with an undisciplined multitude, most dangerous.

  [Marching long distance]
  - » If you set a fully equipped army in march in order to snatch an advantage,
    - ° the chances are that you will be too late.
  - » On the other hand, to detach a flying column for the purpose
    - ° involves the sacrifice of its baggage and stores.
  - » [Marching 100 LI]
    - ° if you order your men
      - to roll up their buff-coats,
      - and make forced marches without halting day or night,
      - covering double the usual distance at a stretch,
      - doing a hundred LI in order to wrest an advantage,
      - [Consequence]
        - the leaders of all your three divisions will fall into the hands of the enemy.
        - 8. The stronger men will be in front,
        - the jaded ones will fall behind,
        - and on this plan only one-tenth of your army will reach its destination.
  - » [Marching 50 LI]
    - ° 9. If you march fifty LI in order to outmaneuver

```
     the enemy,
     - you will lose the leader of your first division,
     - and only half your force will reach the goal.
   » [Marching 30 LI]
     ° 10. If you march thirty LI with the same object,
       - two-thirds of your army will arrive.
   » 11. We may take it then
     ° that an army without its baggage-train is lost;
     ° without provisions it is lost;
     ° without bases of supply it is lost.
 [Terrain]
   » 12. We cannot enter into alliances until we are
     acquainted with the designs of our neighbors.
   » 13. We are not fit to lead an army on the march
     unless we are familiar with the face of the country--
     ° its mountains and forests,
     ° its pitfalls and precipices,
     ° its marshes and swamps.
   » 14. We shall be unable to turn natural advantage to
     account unless we make use of local guides.
 [Deception]
   » 15. War is based on deception
     ° move with opportunity
       - 16. divide and concentrate according to the
         variables
   » Therefore,
     ° 17. Let your rapidity be that of the wind,
     °  your compactness that of the forest.
     ° 18. In raiding and plundering be like fire,
     °  in immovability like a mountain.
     ° Let your plans be dark and impenetrable as night,
     ° and when you move, fall like a thunderbolt.
     ° 20. When you plunder a countryside,
       - let the spoil be divided amongst your men;
     ° when you capture new territory,
       - cut it up into allotments for the benefit of the
         soldiery.
   » 21. Ponder and deliberate before you make a move.
   » 22. He will conquer who has learnt the artifice of
     deviation.
 Such is the art of contending
```

- **Circumstances**

```
 [Variation]
   » 23. The Book of Army Management says:
     ° On the field of battle, the spoken word does not
       carry far enough:
       - hence the institution of gongs and drums.
     ° Nor can ordinary objects be seen clearly enough:
       - hence the institution of banners and flags.
     ° 24. Gongs and drums, banners and flags, are means
       whereby the ears and eyes of the host may be focused on
       one particular point.
   » [Host]
```

```
  ° 25. The host thus forming a single united body,
   is it impossible
   - either for the brave to advance alone,
   - or for the cowardly to retreat alone.
  ° This is the art of handling large masses of men.
 » [Night or Day Fighting]
  ° 26. In night-fighting, then,
   - make much use of signal-fires and drums,
  ° and in fighting by day,
   - of flags and banners,
  ° as a means of influencing the ears and eyes of
   your army.
 » [Fighting Spirit]
  ° 27. A whole army may be robbed of its spirit; a
   commander-in-chief may be robbed of his presence of
   mind.
   - 28. Now a soldier's spirit
    - is keenest in the morning;
    - by noonday it has begun to flag;
    - and in the evening, his mind is bent only on
     returning to camp.
  ° This is the art of studying moods.
   - 29. A clever commander, therefore,
    - avoids an army when its spirit is keen,
    - but attacks it when it is sluggish and
     inclined to return.
  ° this is the art of retaining self-possession.
   - 30. Disciplined and calm, to await the
    appearance of disorder and hubbub amongst the enemy:
  ° this is the art of husbanding one's strength.
   - 31. To be near the goal while the enemy is still
    far from it,
   - to wait at ease while the enemy is toiling and
    struggling,
   - to be well-fed while the enemy is famished:
  ° this is the art of studying circumstances.
   - 32. To refrain from intercepting an enemy whose
    banners are in perfect order,
   - to refrain from attacking an army drawn up in
    calm and confident array:
[Military axiom]
 » 33. It is a military axiom:
  ° Not to advance uphill against the enemy,
  ° Nor to oppose him when he comes downhill.
  ° Do not pursue an enemy who simulates flight;
  ° Do not swallow bait offered by the enemy.
  ° Do not attack soldiers whose temper is keen.
  ° Do not interfere with an army that is returning
   home.
  ° Leave an outlet free for a surrounded army.
  ° Do not press a desperate foe too hard.
 » 37. Such is the art of employing troops
```

VIII. NINE VARIATIONS - 九變

Abstract This chapter talks about army positions and what to do in various circumstances.

Huang Zhong's plea for a fight.

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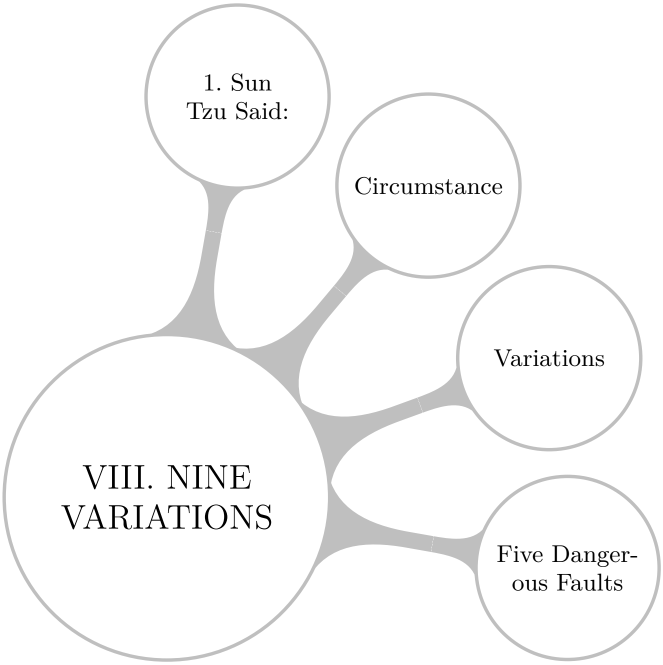
P. van Emde Boas et al., *Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps*, Logic in Asia: Studia Logica Library,
https://doi.org/10.1007/978-981-19-6250-9_18

Main Concepts


1. Sun Tzu Said:
Circumstance
Variations
VIII. NINE VARIATIONS
Five Dangerous Faults

Overview of the Contents

This chapter talks about army positions and what to do in various circumstances.

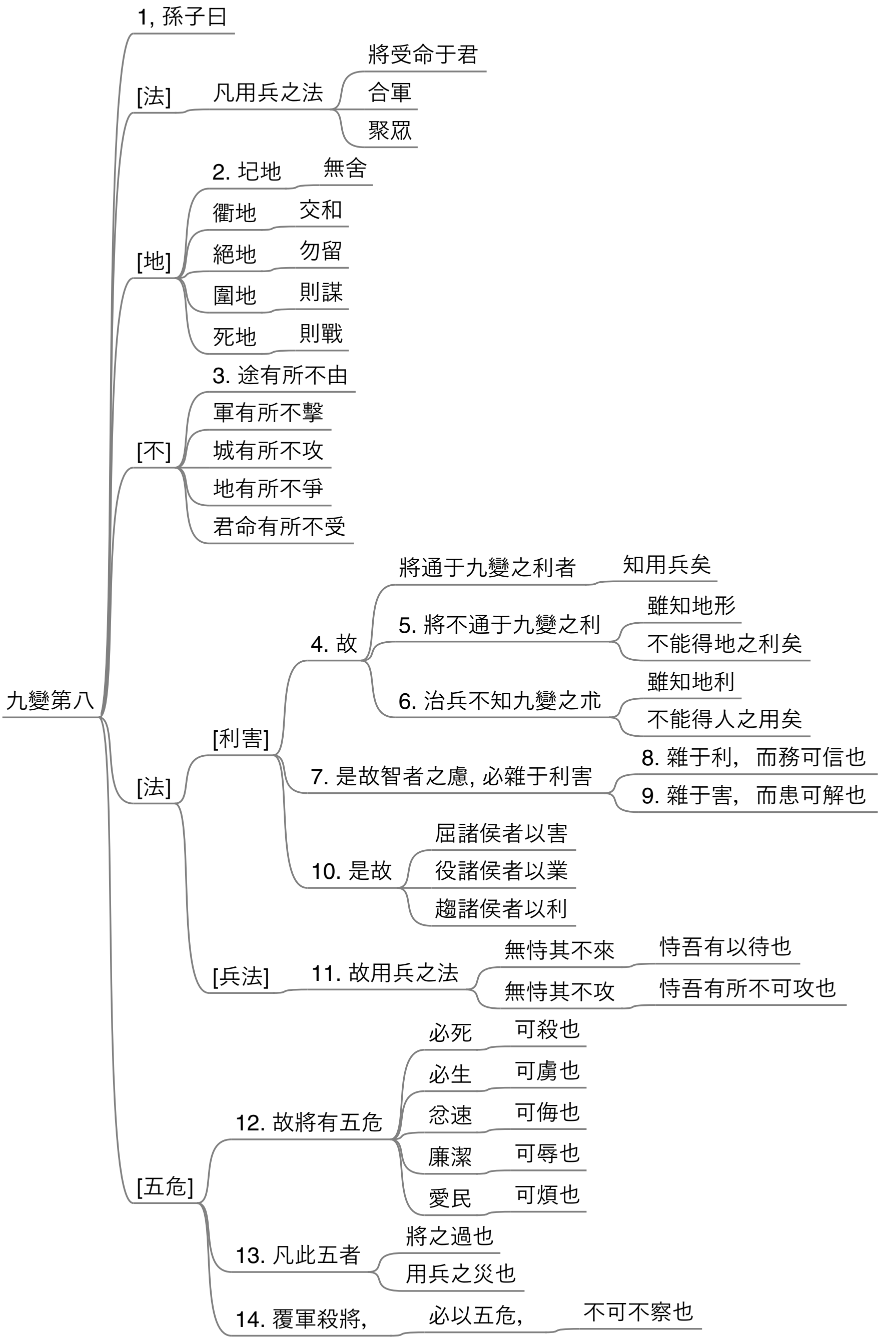
Sun Tzu states that the commander has the highest authority on the battlefield and therefore: *There are commands of the sovereign which must not be obeyed.*

Another illuminating quote from this chapter is: *The art of war teaches us to rely not on the likelihood of the enemy's not coming, but on our own readiness to receive him; not on the chance of his not attacking, but rather on the fact that we have made our position unassailable.*

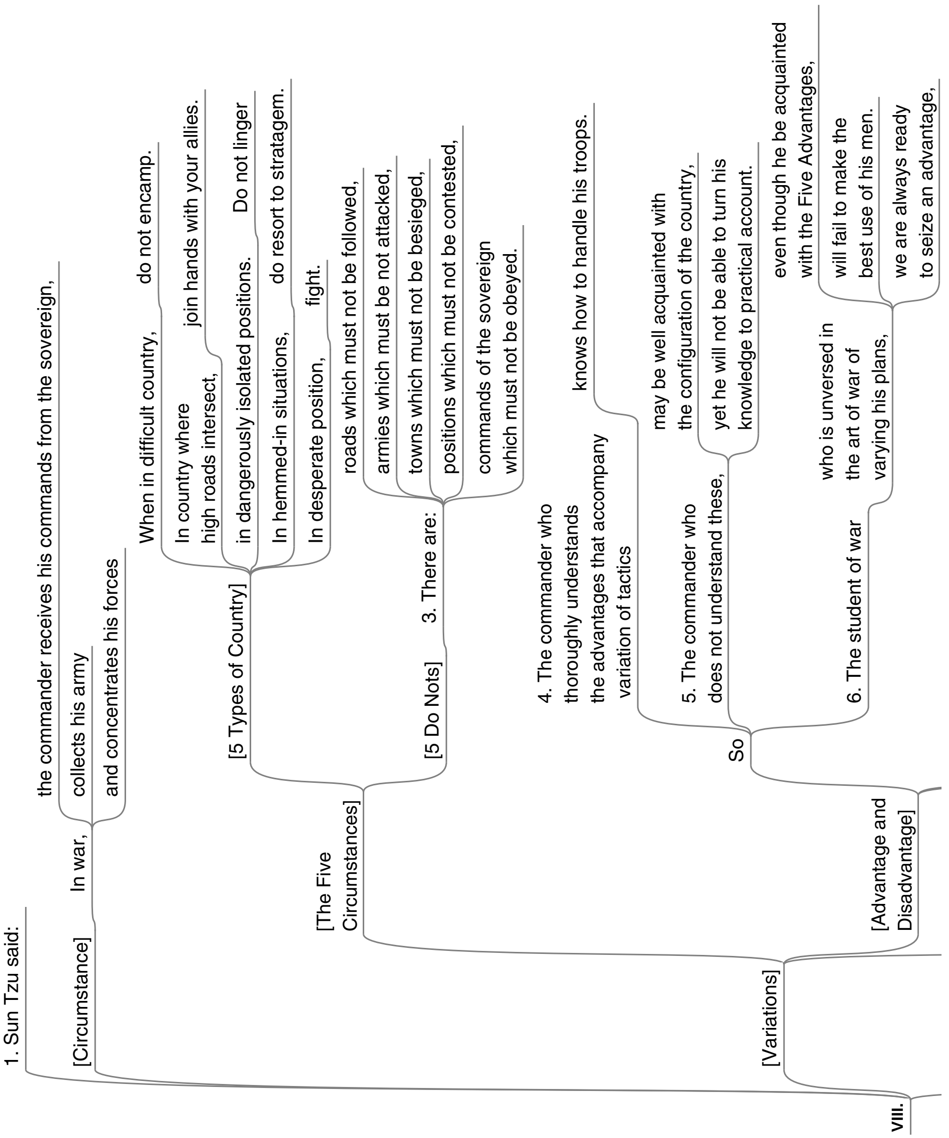
According to Mair [46, page 29], this chapter is not only the shortest but also one of the oldest chapters in the AoW.

Mind Maps

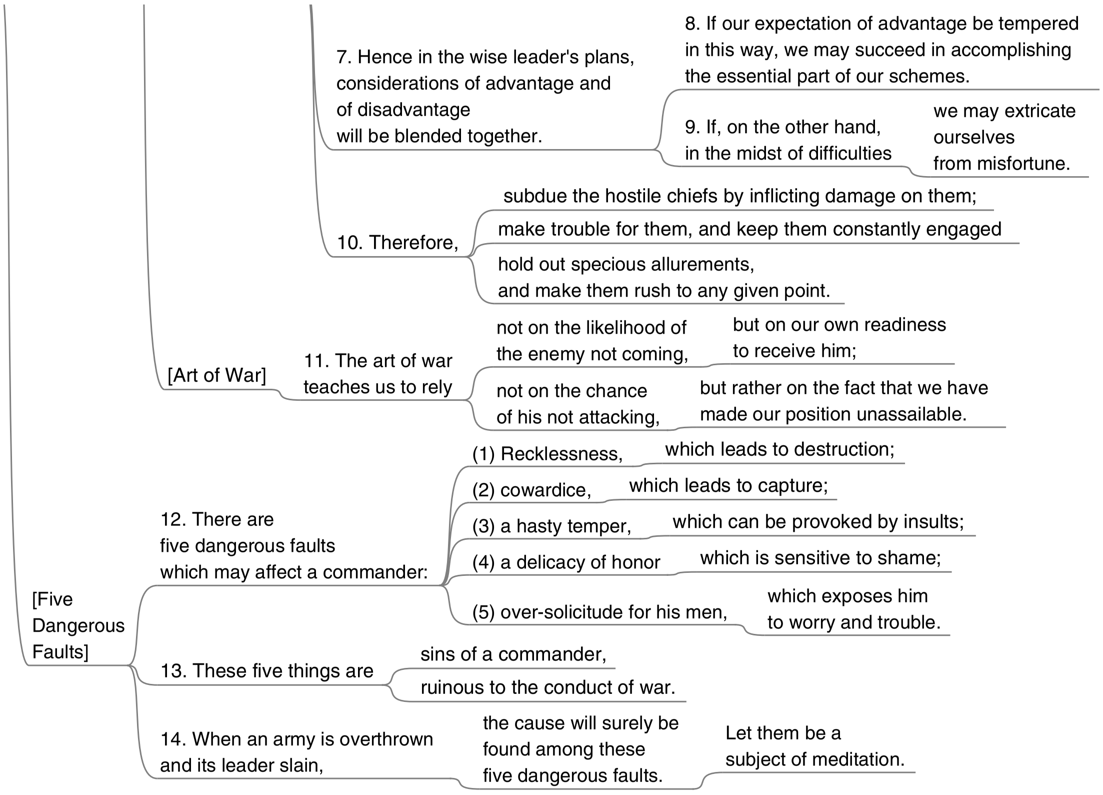
The overview for this chapter can be found in mind map figures 36 to 38.


九變第八
1, 孫子曰
[法]
凡用兵之法
將受命于君
合軍
聚衆
[地]
2. 圮地
無舍
衢地
交和
絕地
勿留
圍地
則謀
死地
則戰
[不]
3. 途有所不由
軍有所不擊
城有所不攻
地有所不爭
君命有所不受
[法]
[利害]
4. 故
將通于九變之利者
知用兵矣
5. 將不通于九變之利
雖知地形
不能得地之利矣
6. 治兵不知九變之朮
雖知地利
不能得人之用矣
7. 是故智者之慮, 必雜于利害
8. 雜于利，而務可信也
9. 雜于害，而患可解也
10. 是故
屈諸侯者以害
役諸侯者以業
趨諸侯者以利
[兵法]
11. 故用兵之法
無恃其不來
恃吾有以待也
無恃其不攻
恃吾有所不可攻也
[五危]
12. 故將有五危
必死
可殺也
必生
可虜也
忿速
可侮也
廉潔
可辱也
愛民
可煩也
13. 凡此五者
將之過也
用兵之災也
14. 覆軍殺將,
必以五危,
不可不察也

Mind Map 36: AoW chapter VIII - Chinese Mind Map


VIII.
1. Sun Tzu said:
[Circumstance]
In war,
the commander receives his commands from the sovereign,
collects his army
and concentrates his forces
[Variations]
[The Five Circumstances]
[5 Types of Country]
When in difficult country,
do not encamp.
In country where high roads intersect,
join hands with your allies.
in dangerously isolated positions.
Do not linger
In hemmed-in situations,
do resort to stratagem.
In desperate position,
fight.
[5 Do Nots]
3. There are:
roads which must not be followed,
armies which must be not attacked,
towns which must not be besieged,
positions which must not be contested,
commands of the sovereign which must not be obeyed.
[Advantage and Disadvantage]
So
4. The commander who thoroughly understands the advantages that accompany variation of tactics
knows how to handle his troops.
5. The commander who does not understand these,
may be well acquainted with the configuration of the country,
yet he will not be able to turn his knowledge to practical account.
6. The student of war
who is unversed in the art of war of varying his plans,
even though he be acquainted with the Five Advantages,
will fail to make the best use of his men.
we are always ready to seize an advantage,

Mind Map 37: AoW ch. VIII - NINE VARIATIONS - Part 1



7. Hence in the wise leader's plans, considerations of advantage and of disadvantage will be blended together.
8. If our expectation of advantage be tempered in this way, we may succeed in accomplishing the essential part of our schemes.
9. If, on the other hand, in the midst of difficulties
we may extricate ourselves from misfortune.
10. Therefore,
subdue the hostile chiefs by inflicting damage on them;
make trouble for them, and keep them constantly engaged
hold out specious allurements, and make them rush to any given point.
[Art of War]
11. The art of war teaches us to rely
not on the likelihood of the enemy not coming,
but on our own readiness to receive him;
not on the chance of his not attacking,
but rather on the fact that we have made our position unassailable.
[Five Dangerous Faults]
12. There are five dangerous faults which may affect a commander:
(1) Recklessness,
which leads to destruction;
(2) cowardice,
which leads to capture;
(3) a hasty temper,
which can be provoked by insults;
(4) a delicacy of honor
which is sensitive to shame;
(5) over-solicitude for his men,
which exposes him to worry and trouble.
13. These five things are
sins of a commander,
ruinous to the conduct of war.
14. When an army is overthrown and its leader slain,
the cause will surely be found among these five dangerous faults.
Let them be a subject of meditation.

Mind Map 38: AoW ch. VIII - NINE VARIATIONS - Part 2

Details and Patterns

Sun Tzu Said:

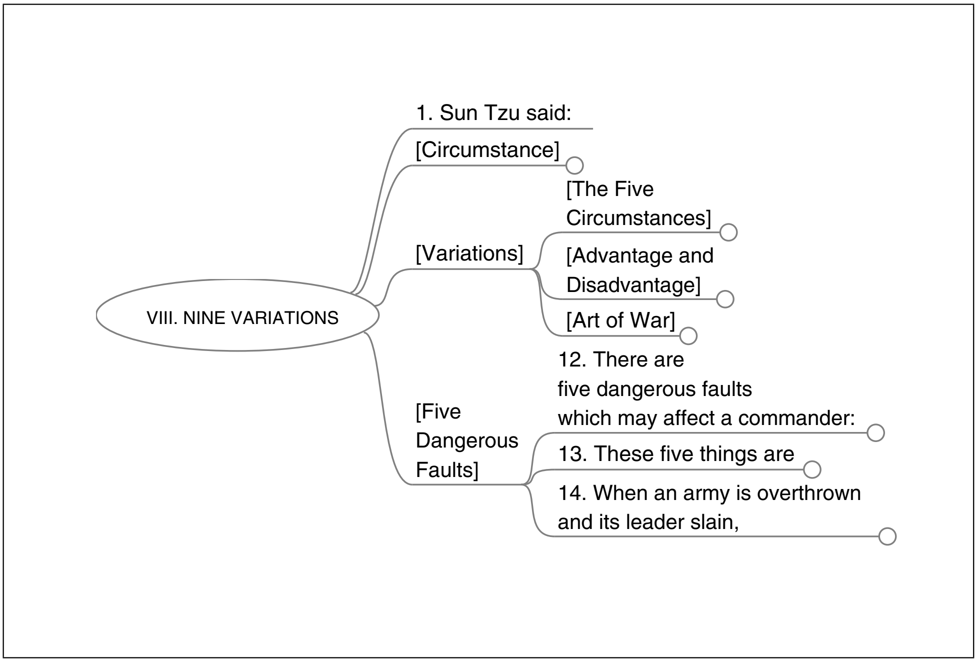

VIII. NINE VARIATIONS
1. Sun Tzu said:
[Circumstance]
[Variations]
[The Five Circumstances]
[Advantage and Disadvantage]
[Art of War]
[Five Dangerous Faults]
12. There are five dangerous faults which may affect a commander:
13. These five things are
14. When an army is overthrown and its leader slain,

Fig. 89: AoW Ch.VII - Mind Map Overview

For a comparison with other chapters that refer to *terrain*, see: Terrain, on page 397. We could not find any *metaphors* in this chapter.

Circumstance

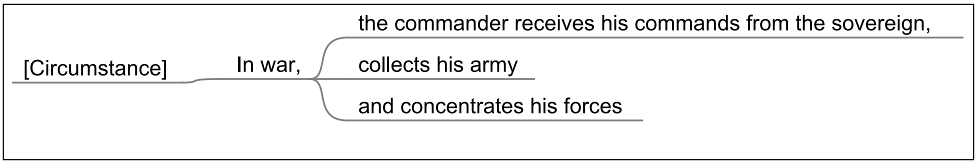

[Circumstance]
In war,
the commander receives his commands from the sovereign,
collects his army
and concentrates his forces

Fig. 90: Circumstance

- **Conditional Sentences**
  - Par. 1 `Universal quantification 凡, Judge.`

Variations

- **Conditional Sentences**
  - Par. 1 `Universal quantification 凡, Judge.` .
  - Par. 2: `When in difficult country,…` `(5 Cond. => Adv.)` .
  - Par. 3: `There are:` …Five negative instructions.
  - Par. 4-5: `The commander who …` `2 (Cond. => Conseq. (故)` , if-then-else construction.
  - Par. 6: `The student of war …` `(2 Cond. => Conseq.)` .
  - Par. 7: `Hence in the wise leader's plans,…` `=> Judge. (故)` .
  - Par. 8-9: `If our expectation of advantage…` `2 (Cond. => Conseq.)` .
  - Par. 10: `Therefore,…` `=> Judge. (故)` .
  - Par. 11: `The Art of War teaches us…` `=> Judge. (故)` .

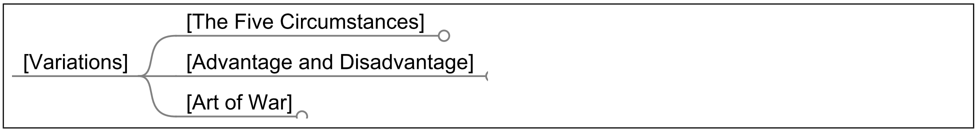

[Variations]
[The Five Circumstances]
[Advantage and Disadvantage]
[Art of War]

Fig. 91: Variations

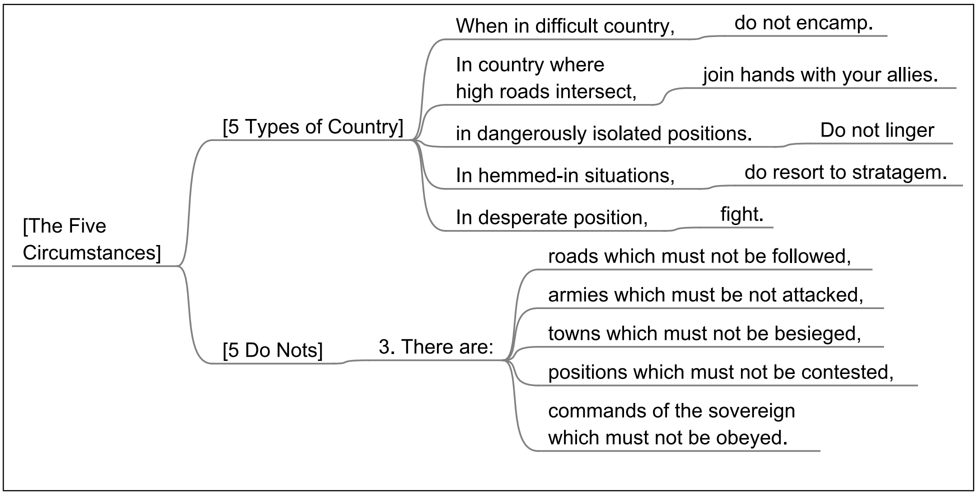
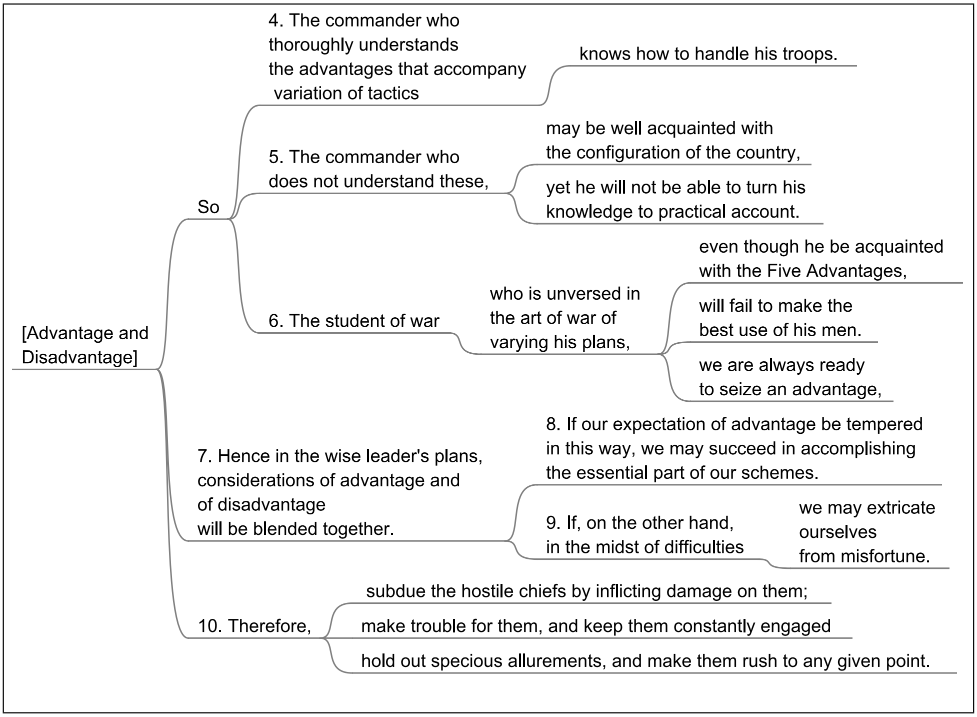

[The Five Circumstances]
[5 Types of Country]
When in difficult country,
do not encamp.
In country where high roads intersect,
join hands with your allies.
in dangerously isolated positions.
Do not linger
In hemmed-in situations,
do resort to stratagem.
In desperate position,
fight.
[5 Do Nots]
3. There are:
roads which must not be followed,
armies which must be not attacked,
towns which must not be besieged,
positions which must not be contested,
commands of the sovereign which must not be obeyed.

Fig. 92: Variations - The Five Circumstances

- **Pairs of Opposites**
  - Par. 4-5: The general who **understands**, or who **does not understand**.
  - Par. 7: **advantage** and **disadvantage**. see: Variations, on page 237.



[Advantage and Disadvantage]

So

4. The commander who thoroughly understands the advantages that accompany variation of tactics

knows how to handle his troops.

5. The commander who does not understand these,

may be well acquainted with the configuration of the country,

yet he will not be able to turn his knowledge to practical account.

6. The student of war

who is unversed in the art of war of varying his plans,

even though he be acquainted with the Five Advantages,

will fail to make the best use of his men.

we are always ready to seize an advantage,

7. Hence in the wise leader's plans, considerations of advantage and of disadvantage will be blended together.

8. If our expectation of advantage be tempered in this way, we may succeed in accomplishing the essential part of our schemes.

9. If, on the other hand, in the midst of difficulties

we may extricate ourselves from misfortune.

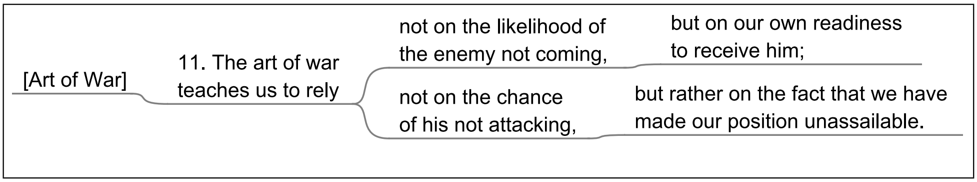
10. Therefore,

subdue the hostile chiefs by inflicting damage on them;

make trouble for them, and keep them constantly engaged

hold out specious allurements, and make them rush to any given point.

Fig. 93: Variations - Advantage and Disadvantage



[Art of War]

11. The art of war teaches us to rely

not on the likelihood of the enemy not coming,

but on our own readiness to receive him;

not on the chance of his not attacking,

but rather on the fact that we have made our position unassailable.

Fig. 94: Variations - The Art of War

- **Conditional Sentences**
  - Par. 12: `There are five dangerous faults…` `=> Judge. (故)` ; 也 closes a definition (5 x).
  - Par. 14: `When an army is overthrown…` `Cond. => Adv.` ; reversed but not indicated by 也.

Five Dangerous Faults

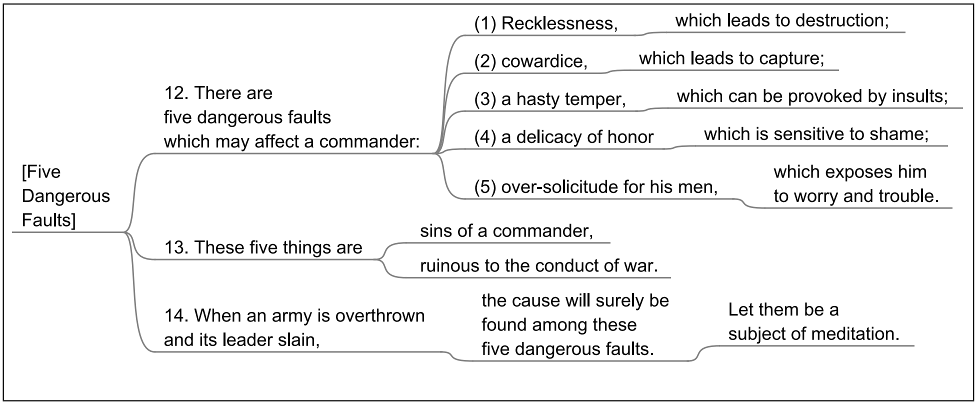

[Five Dangerous Faults]
12. There are five dangerous faults which may affect a commander:
(1) Recklessness,
which leads to destruction;
(2) cowardice,
which leads to capture;
(3) a hasty temper,
which can be provoked by insults;
(4) a delicacy of honor
which is sensitive to shame;
(5) over-solicitude for his men,
which exposes him to worry and trouble.
13. These five things are
sins of a commander,
ruinous to the conduct of war.
14. When an army is overthrown and its leader slain,
the cause will surely be found among these five dangerous faults.
Let them be a subject of meditation.

Fig. 95: Five Dangerous Faults

Structured Text

VIII. NINE VARIATIONS

- **1. Sun Tzu Said:**

- **Circumstance**

```
 In war,
  » the commander receives his commands from the
    sovereign,
  » collects his army
  » and concentrates his forces
```

- **Variations**

```
[The Five Circumstances]
  » [5 Types of Country]
    ° When in difficult country,
      - do not encamp.
    ° In country where high roads intersect,
      -  join hands with your allies.
    ° in dangerously isolated positions.
      - Do not linger
    ° In encircled situations,
      - do resort to stratagem.
    ° In desperate position,
      -   fight.
  » [5 Do Nots]
    ° 3. There are:
      - roads which must not be followed,
      - armies which must be not attacked,
      - towns which must not be besieged,
      - positions which must not be contested,
      - commands of the sovereign which must not be
        obeyed.
[Advantage and Disadvantage]
  » So
    ° 4. The commander who thoroughly understands the
      advantages that accompany variation of tactics
      - knows how to handle his troops.
    ° 5. The commander who does not understand these,
      - may be well acquainted with the configuration of
        the country,
      - yet he will not be able to turn his knowledge to
        practical account.
    ° 6. The student of war
      - who is unversed in the art of war of varying his
        plans,
        - even though he be acquainted with the Five
          Advantages,
        - will fail to make the best use of his men.
        - we are always ready to seize an advantage,
  » 7. Hence in the wise leader's plans, considerations
```

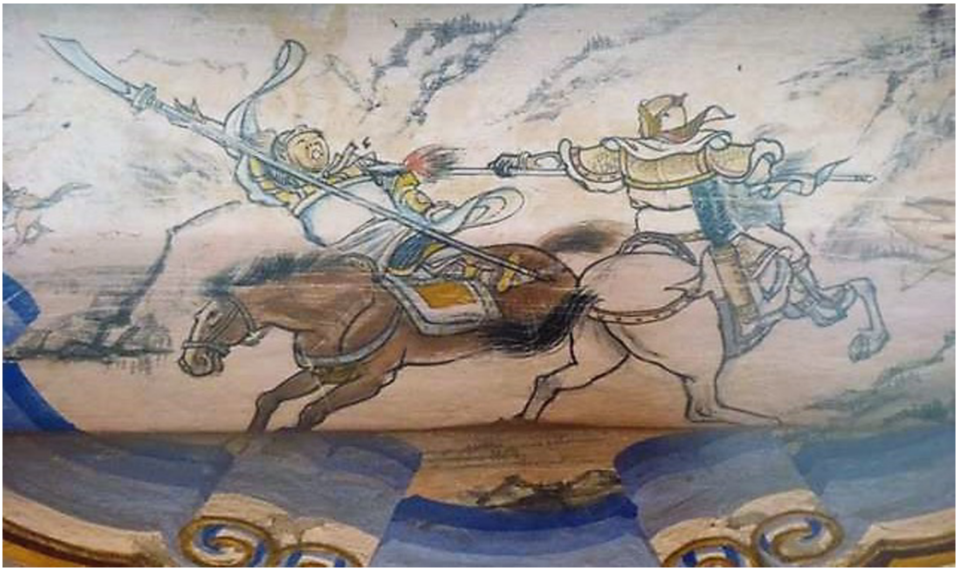
```
    of advantage and of disadvantage will be blended
    together.
    ° 8. If our expectation of advantage be tempered in
      this way, we may succeed in accomplishing the essential
      part of our schemes.
    ° 9. If, on the other hand, in the midst of
      difficulties
      - we may extricate ourselves from misfortune.
  » 10. Therefore,
    °  subdue the hostile chiefs by inflicting damage
      on them;
    ° make trouble for them, and keep them constantly
      engaged
    ° hold out specious allurements, and make them rush
      to any given point.
[Art of War]
  » 11. The art of war teaches us to rely
    ° not on the likelihood of the enemy not coming,
      - but on our own readiness to receive him;
    ° not on the chance of his not attacking,
      - but rather on the fact that we have made our
        position unassailable.
```

- **Five Dangerous Faults**

```
12. There are five dangerous faults which may affect a
commander:
  » (1) Recklessness,
    ° which leads to destruction;
  » (2) cowardice,
    ° which leads to capture;
  » (3) a hasty temper,
    ° which can be provoked by insults;
  » (4) a delicacy of honor
    ° which is sensitive to shame;
  » (5) over-solicitude for his men,
    ° which exposes him to worry and trouble.
13. These five things are
  »  sins of a commander,
  »  ruinous to the conduct of war.
14. When an army is overthrown and its leader slain,
  » the cause will surely be found among these five
    dangerous faults.
    ° Let them be a subject of meditation.
```

IX. THE ARMY ON THE MARCH - 行軍

Abstract This chapter talks about Useful Military Knowledge, Terrain Type, Army Surroundings, Circumstances, and Commanding.



Zhao Yun leading an out-numbered winning.

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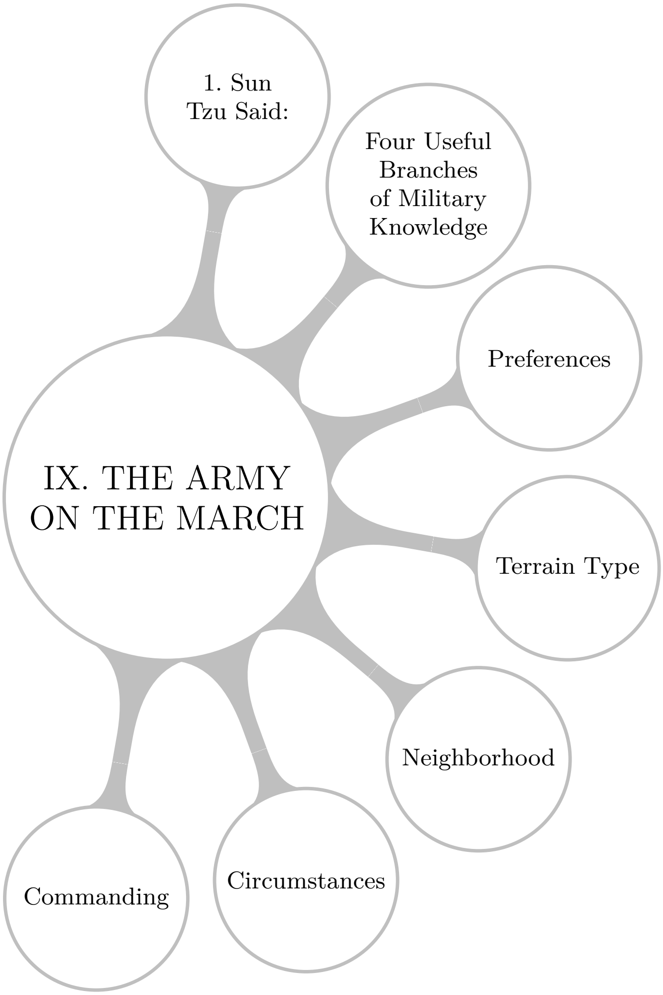
P. van Emde Boas et al., *Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps*, Logic in Asia: Studia Logica Library,
https://doi.org/10.1007/978-981-19-6250-9_19

Main Concepts

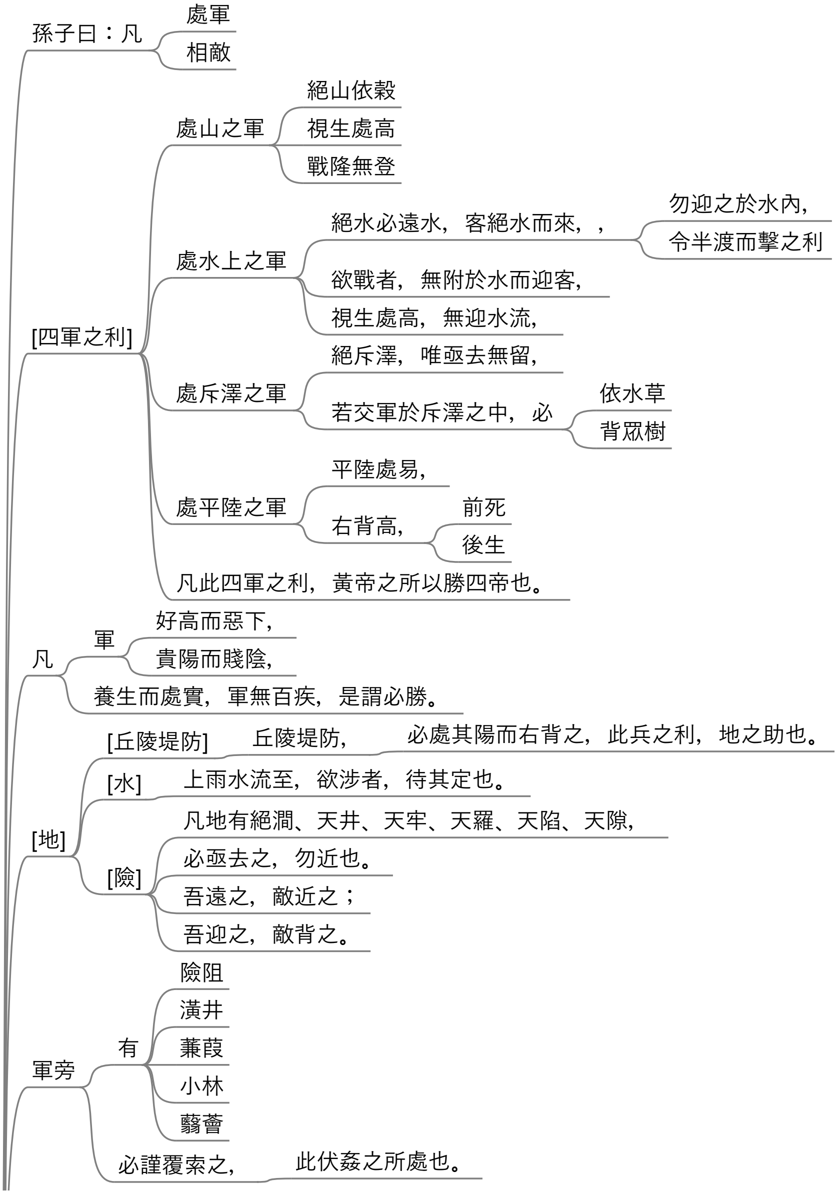

IX. THE ARMY ON THE MARCH
1. Sun Tzu Said:
Four Useful Branches of Military Knowledge
Preferences
Terrain Type
Neighborhood
Circumstances
Commanding

Overview of the Contents

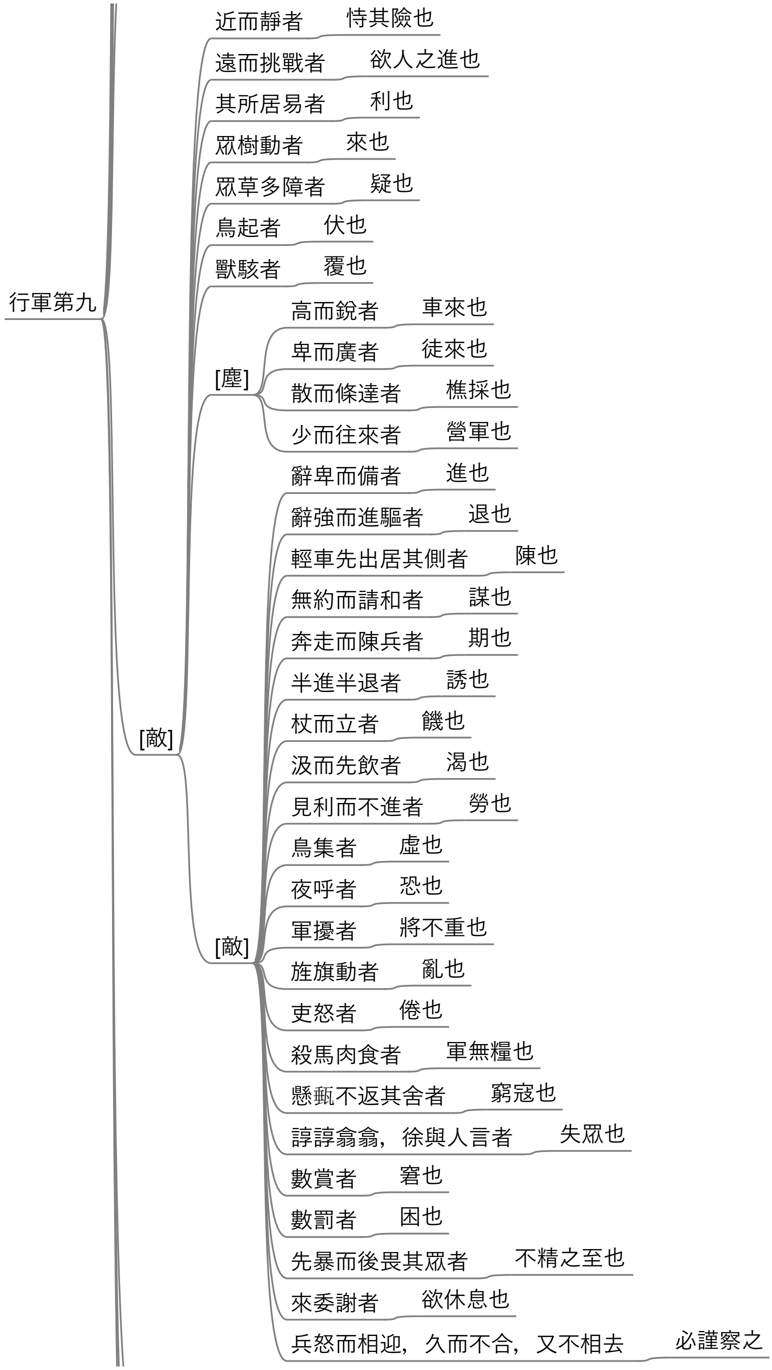
This is a long chapter dealing with warfare in different conditions, places, what can happen while marching, and rules for commanding. The first line effectively sums it up, Sun Tzu Said: *We come now to the question of encamping the army, and observing signs of the enemy.*

Mind Maps

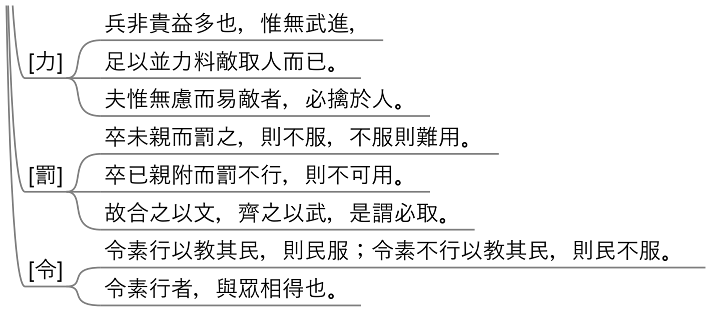
The overview for this chapter can be found in mind map figures 39 to 46.


孫子曰：凡
處軍
相敵
[四軍之利]
處山之軍
絕山依穀
視生處高
戰隆無登
處水上之軍
絕水必遠水，客絕水而來，，
勿迎之於水內，
令半渡而擊之利
欲戰者，無附於水而迎客，
視生處高，無迎水流，
處斥澤之軍
絕斥澤，唯亟去無留，
若交軍於斥澤之中，必
依水草
背眾樹
處平陸之軍
平陸處易，
右背高，
前死
後生
凡此四軍之利，黃帝之所以勝四帝也。
凡
軍
好高而惡下，
貴陽而賤陰，
養生而處實，軍無百疾，是謂必勝。
[地]
[丘陵堤防]
丘陵堤防，
必處其陽而右背之，此兵之利，地之助也。
[水]
上雨水流至，欲涉者，待其定也。
[險]
凡地有絕澗、天井、天牢、天羅、天陷、天隙，
必亟去之，勿近也。
吾遠之，敵近之；
吾迎之，敵背之。
軍旁
有
險阻
潢井
蒹葭
小林
蘙薈
必謹覆索之，
此伏姦之所處也。

Mind Map 39: AoW Chapter IX - Part 1

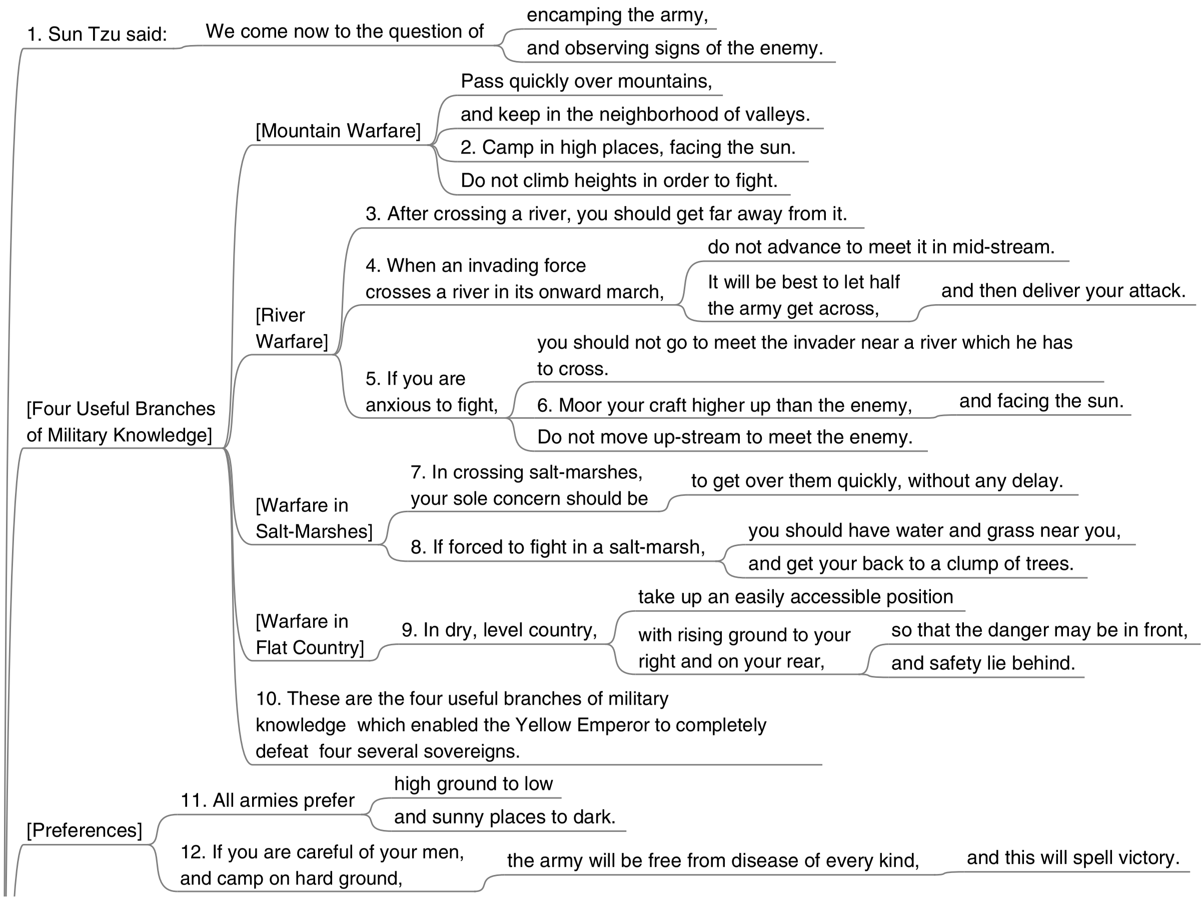

行軍第九
[敵]
近而靜者
恃其險也
遠而挑戰者
欲人之進也
其所居易者
利也
眾樹動者
來也
眾草多障者
疑也
鳥起者
伏也
獸駭者
覆也
[塵]
高而銳者
車來也
卑而廣者
徒來也
散而條達者
樵採也
少而往來者
營軍也
[敵]
辭卑而備者
進也
辭強而進驅者
退也
輕車先出居其側者
陳也
無約而請和者
謀也
奔走而陳兵者
期也
半進半退者
誘也
杖而立者
饑也
汲而先飲者
渴也
見利而不進者
勞也
鳥集者
虚也
夜呼者
恐也
軍擾者
將不重也
旌旗動者
亂也
吏怒者
倦也
殺馬肉食者
軍無糧也
懸甀不返其舍者
窮寇也
諄諄翕翕，徐與人言者
失眾也
數賞者
窘也
數罰者
困也
先暴而後畏其眾者
不精之至也
來委謝者
欲休息也
兵怒而相迎，久而不合，又不相去
必謹察之

Mind Map 40: AoW Chapter IX - Part 2

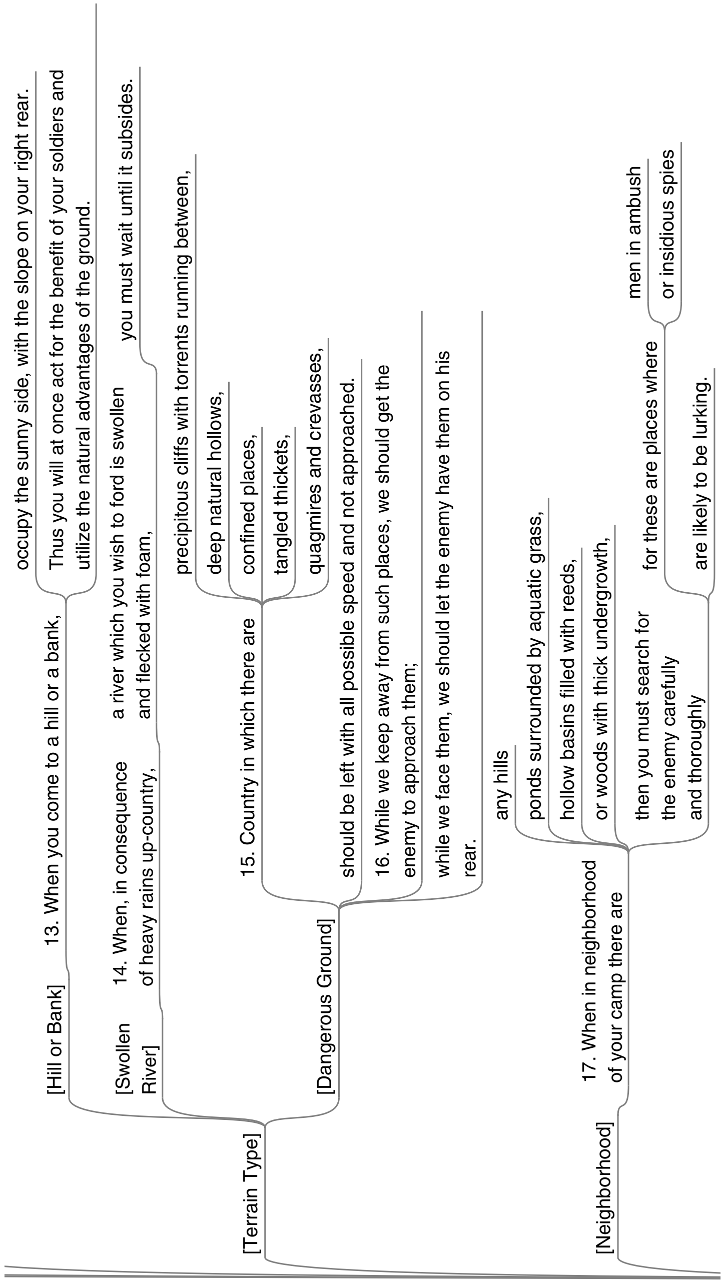


- [力]
  - 兵非貴益多也，惟無武進，
  - 足以並力料敵取人而已。
  - 夫惟無慮而易敵者，必擒於人。
- [罰]
  - 卒未親而罰之，則不服，不服則難用。
  - 卒已親附而罰不行，則不可用。
  - 故合之以文，齊之以武，是謂必取。
- [令]
  - 令素行以教其民，則民服；令素不行以教其民，則民不服。
  - 令素行者，與眾相得也。

Mind Map 41: AoW Chapter IX - Part 3

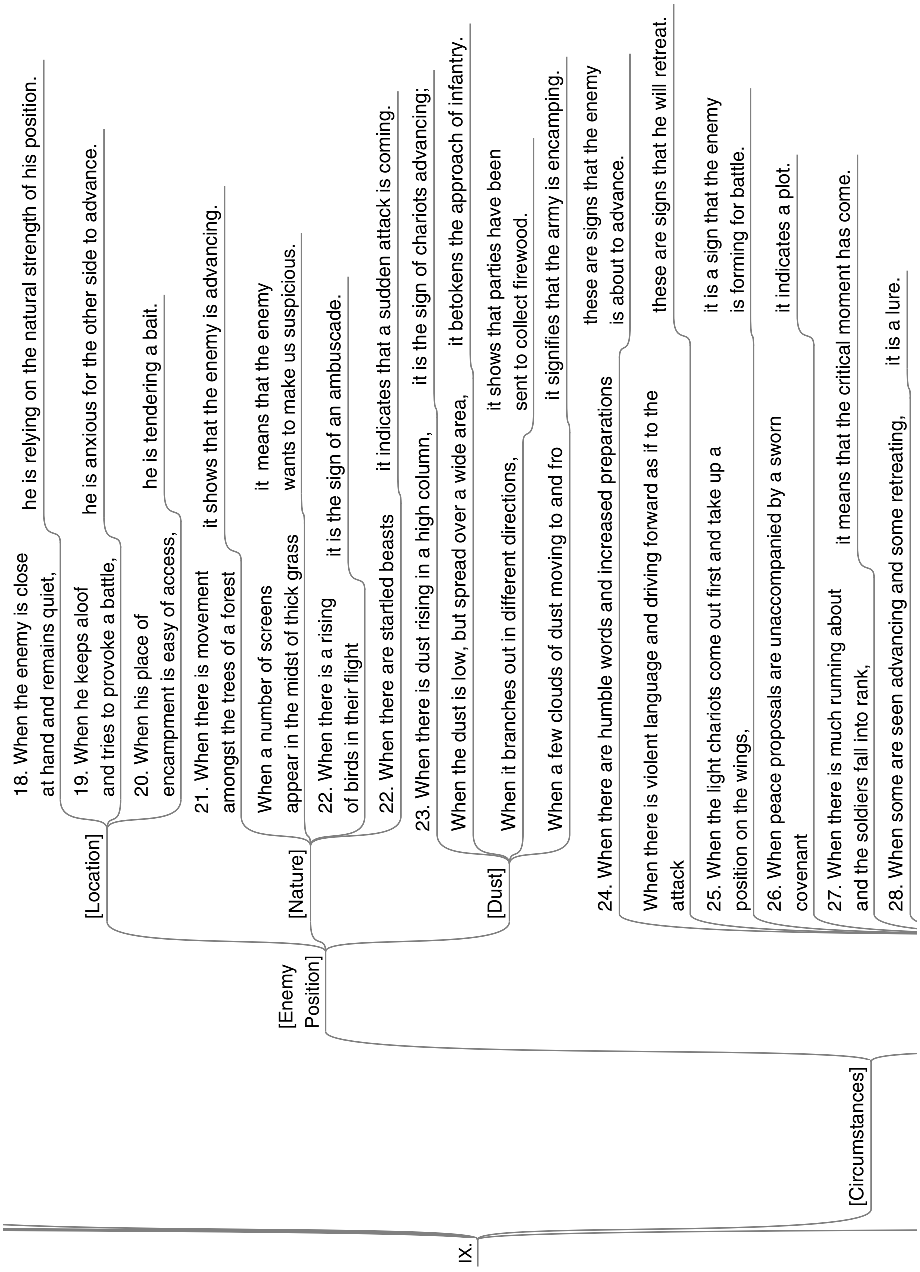

1. Sun Tzu said:
We come now to the question of
encamping the army,
and observing signs of the enemy.
[Four Useful Branches of Military Knowledge]
[Mountain Warfare]
Pass quickly over mountains,
and keep in the neighborhood of valleys.
2. Camp in high places, facing the sun.
Do not climb heights in order to fight.
[River Warfare]
3. After crossing a river, you should get far away from it.
4. When an invading force crosses a river in its onward march,
do not advance to meet it in mid-stream.
It will be best to let half the army get across,
and then deliver your attack.
5. If you are anxious to fight,
you should not go to meet the invader near a river which he has to cross.
6. Moor your craft higher up than the enemy,
and facing the sun.
Do not move up-stream to meet the enemy.
[Warfare in Salt-Marshes]
7. In crossing salt-marshes, your sole concern should be
to get over them quickly, without any delay.
8. If forced to fight in a salt-marsh,
you should have water and grass near you,
and get your back to a clump of trees.
[Warfare in Flat Country]
9. In dry, level country,
take up an easily accessible position
with rising ground to your right and on your rear,
so that the danger may be in front,
and safety lie behind.
10. These are the four useful branches of military knowledge which enabled the Yellow Emperor to completely defeat four several sovereigns.
[Preferences]
11. All armies prefer
high ground to low
and sunny places to dark.
12. If you are careful of your men, and camp on hard ground,
the army will be free from disease of every kind,
and this will spell victory.

Mind Map 42: AoW Chapter IX - THE ARMY ON THE MARCH - Part 1

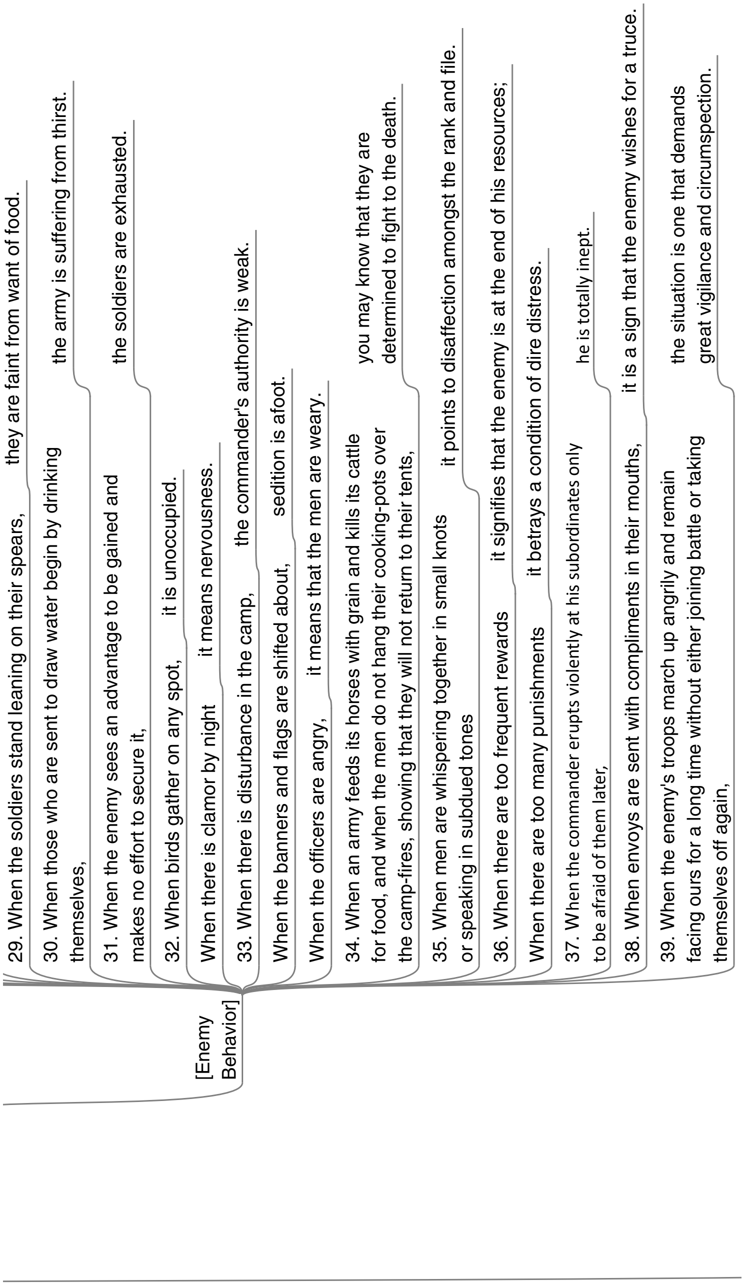


- [Terrain Type]
  - [Hill or Bank]
    - 13. When you come to a hill or a bank,
      - occupy the sunny side, with the slope on your right rear.
      - Thus you will at once act for the benefit of your soldiers and utilize the natural advantages of the ground.
  - [Swollen River]
    - 14. When, in consequence of heavy rains up-country,
      - a river which you wish to ford is swollen and flecked with foam,
        - you must wait until it subsides.
  - [Dangerous Ground]
    - 15. Country in which there are
      - precipitous cliffs with torrents running between,
      - deep natural hollows,
      - confined places,
      - tangled thickets,
      - quagmires and crevasses,
    - should be left with all possible speed and not approached.
    - 16. While we keep away from such places, we should get the enemy to approach them;
    - while we face them, we should let the enemy have them on his rear.
- [Neighborhood]
  - 17. When in neighborhood of your camp there are
    - any hills
    - ponds surrounded by aquatic grass,
    - hollow basins filled with reeds,
    - or woods with thick undergrowth,
    - then you must search for the enemy carefully and thoroughly
      - for these are places where
        - men in ambush
        - or insidious spies
      - are likely to be lurking.

Mind Map 43: AoW Chapter IX - THE ARMY ON THE MARCH - Part 2


IX.
[Circumstances]
[Enemy Position]
[Location]
18. When the enemy is close at hand and remains quiet,
he is relying on the natural strength of his position.
19. When he keeps aloof and tries to provoke a battle,
he is anxious for the other side to advance.
20. When his place of encampment is easy of access,
he is tendering a bait.
[Nature]
21. When there is movement amongst the trees of a forest
it shows that the enemy is advancing.
When a number of screens appear in the midst of thick grass
it means that the enemy wants to make us suspicious.
22. When there is a rising of birds in their flight
it is the sign of an ambuscade.
22. When there are startled beasts
it indicates that a sudden attack is coming.
[Dust]
23. When there is dust rising in a high column,
it is the sign of chariots advancing;
When the dust is low, but spread over a wide area,
it betokens the approach of infantry.
When it branches out in different directions,
it shows that parties have been sent to collect firewood.
When a few clouds of dust moving to and fro
it signifies that the army is encamping.
24. When there are humble words and increased preparations
these are signs that the enemy is about to advance.
When there is violent language and driving forward as if to the attack
these are signs that he will retreat.
25. When the light chariots come out first and take up a position on the wings,
it is a sign that the enemy is forming for battle.
26. When peace proposals are unaccompanied by a sworn covenant
it indicates a plot.
27. When there is much running about and the soldiers fall into rank,
it means that the critical moment has come.
28. When some are seen advancing and some retreating,
it is a lure.

Mind Map 44: AoW Chapter IX - THE ARMY ON THE MARCH - Part 3



[Enemy Behavior]

29. When the soldiers stand leaning on their spears, they are faint from want of food.

30. When those who are sent to draw water begin by drinking themselves, the army is suffering from thirst.

31. When the enemy sees an advantage to be gained and makes no effort to secure it, the soldiers are exhausted.

32. When birds gather on any spot, it is unoccupied.

When there is clamor by night it means nervousness.

33. When there is disturbance in the camp, the commander's authority is weak.

When the banners and flags are shifted about, sedition is afoot.

When the officers are angry, it means that the men are weary.

34. When an army feeds its horses with grain and kills its cattle for food, and when the men do not hang their cooking-pots over the camp-fires, showing that they will not return to their tents, you may know that they are determined to fight to the death.

35. When men are whispering together in small knots or speaking in subdued tones it points to disaffection amongst the rank and file.

36. When there are too frequent rewards it signifies that the enemy is at the end of his resources;

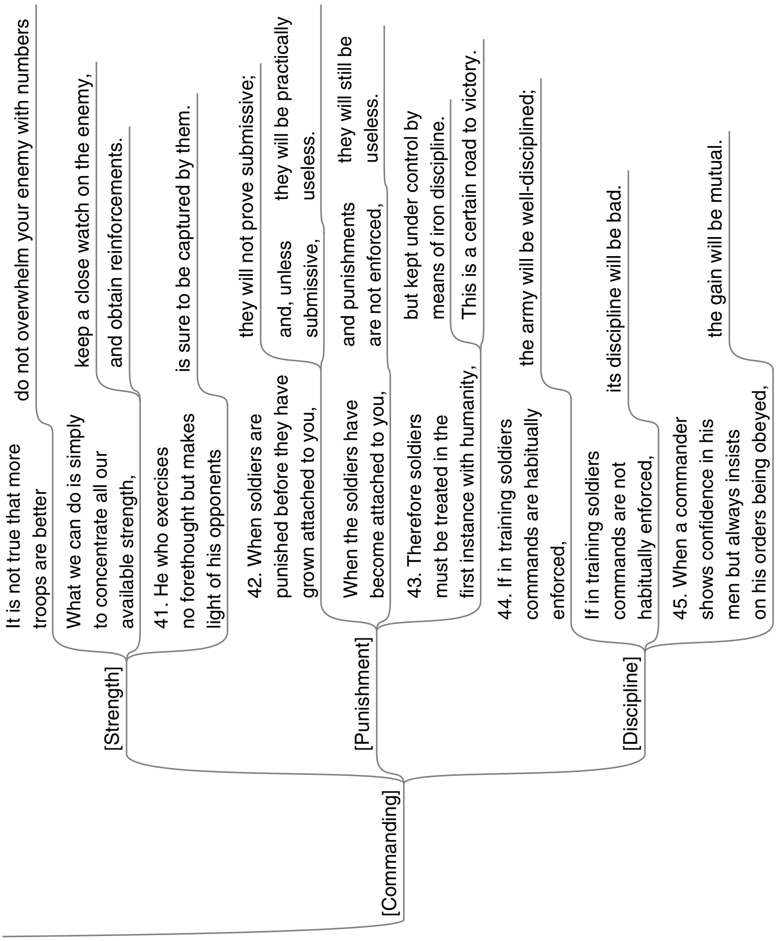
When there are too many punishments it betrays a condition of dire distress.

37. When the commander erupts violently at his subordinates only to be afraid of them later, he is totally inept.

38. When envoys are sent with compliments in their mouths, it is a sign that the enemy wishes for a truce.

39. When the enemy's troops march up angrily and remain facing ours for a long time without either joining battle or taking themselves off again, the situation is one that demands great vigilance and circumspection.

Mind Map 45: AoW Chapter IX - THE ARMY ON THE MARCH - Part 4



[Commanding]

[Strength]

It is not true that more troops are better
do not overwhelm your enemy with numbers

What we can do is simply to concentrate all our available strength,
keep a close watch on the enemy,
and obtain reinforcements.

41. He who exercises no forethought but makes light of his opponents
is sure to be captured by them.

[Punishment]

42. When soldiers are punished before they have grown attached to you,
they will not prove submissive;
and, unless submissive,
they will be practically useless.

When the soldiers have become attached to you,
and punishments are not enforced,
they will still be useless.

43. Therefore soldiers must be treated in the first instance with humanity,
but kept under control by means of iron discipline.
This is a certain road to victory.

[Discipline]

44. If in training soldiers commands are habitually enforced,
the army will be well-disciplined;

If in training soldiers commands are not habitually enforced,
its discipline will be bad.

45. When a commander shows confidence in his men but always insists on his orders being obeyed,
the gain will be mutual.

Mind Map 46: AoW Chapter IX - Part 5

Details and Patterns

In this chapter 也 (yě) is frequently used (44 times). In classical Chinese, 也 ends an affirmative statement, therefore we can interpret most of these as conditional sentences. A prime example is the subject **Enemy Behavior**, see: Enemy Behavior, on page 261, where there are moe than 20 sentences ending in 也 (yě).

An interesting part of this chapter is the subject of Circumstances, on page 259. We see here some twenty conditional sentences that have a *reversed implication.* The description of this pattern can be found here: Reversed Implications, and the Characters 者 (zhě) and 也 (yě), on page 72.

Sun Tzu Said:

This section sums up the content of this chapter:

> Sun Tzu Said: We come now to the question of encamping the army, and observing signs of the enemy.

It describes types of warfare, locations, where to fight and where not, enemy behavior and what it takes to be a commander.

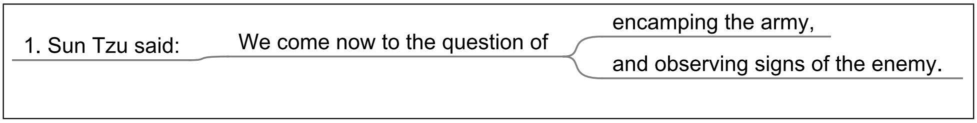

1. Sun Tzu said:
We come now to the question of
encamping the army,
and observing signs of the enemy.

Fig. 96: Sun Tzu Said:

- **Pairs of Opposites** in *Sun Tzu Said:*
  - Par. 1: **mountains** and **valleys**.

- **Conditional Sentences** in *Sun Tzu Said:*
  - Par. 1: Universal quantifier 凡

Four Useful Branches of Military Knowledge

This part handles encamping the army and how to look out for the enemy. An overview of the use of *terrain* can be found here: Terrain, on page 397.

In the original text, each paragraph describing a type of warfare ends with: *So much for....* In our mind map reconstruction we left these sentences out and replaced them with nodes describing the type of warfare, as you can see in figure: 97. In the paragraph about *Mountain Warfare*, Sun Tzu employs a *Pair of Opposites* pattern: mountains and valleys.

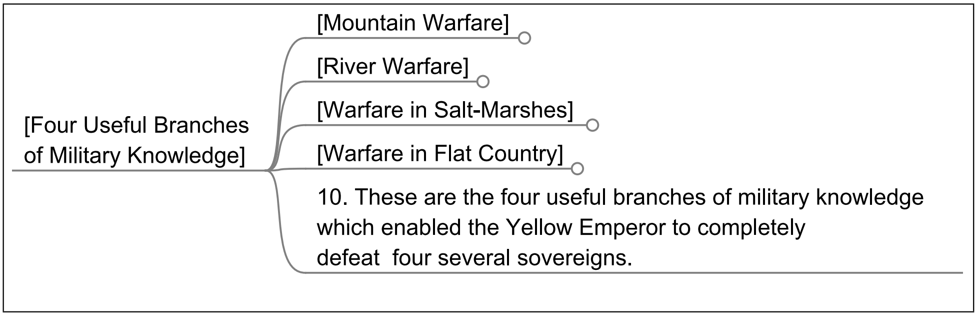

[Four Useful Branches of Military Knowledge]
[Mountain Warfare]
[River Warfare]
[Warfare in Salt-Marshes]
[Warfare in Flat Country]
10. These are the four useful branches of military knowledge which enabled the Yellow Emperor to completely defeat four several sovereigns.

Fig. 97: Four Useful Branches of Military Knowledge

Mountain Warfare

The chapter starts with an *Enumeration* pattern, of four types of warfare: Mountain Warfare, River Warfare, Warfare in Salt-Marshes and Warfare in Flat Country, see figure: 97.

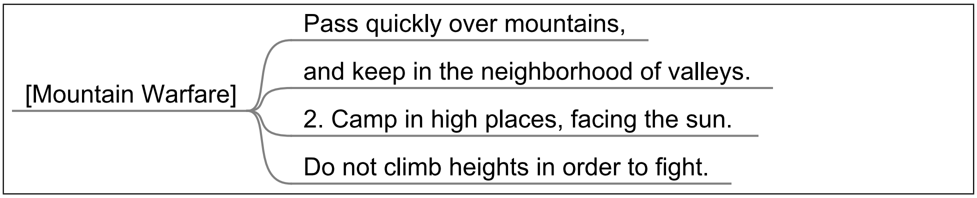

[Mountain Warfare]
Pass quickly over mountains,
and keep in the neighborhood of valleys.
2. Camp in high places, facing the sun.
Do not climb heights in order to fight.

Fig. 98: Mountain Warfare

River Warfare

In this section we did not find additional patterns apart from the described conditions.

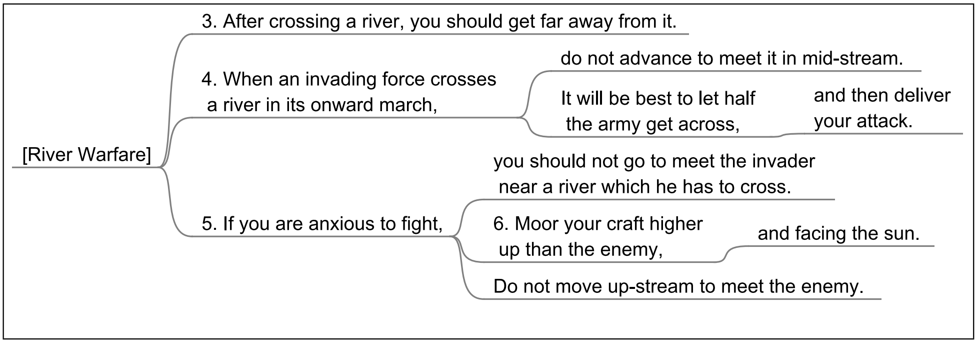

[River Warfare]
3. After crossing a river, you should get far away from it.
4. When an invading force crosses a river in its onward march,
do not advance to meet it in mid-stream.
It will be best to let half the army get across,
and then deliver your attack.
5. If you are anxious to fight,
you should not go to meet the invader near a river which he has to cross.
6. Moor your craft higher up than the enemy,
and facing the sun.
Do not move up-stream to meet the enemy.

Fig. 99: River Warfare

Warfare in Salt-Marshes

In this section we did not find additional patterns apart from the do and don't conditions.

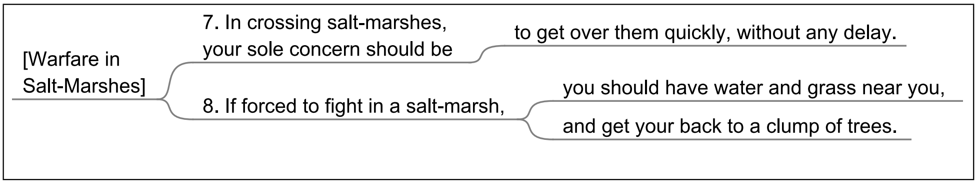

[Warfare in Salt-Marshes]
7. In crossing salt-marshes, your sole concern should be
to get over them quickly, without any delay.
8. If forced to fight in a salt-marsh,
you should have water and grass near you,
and get your back to a clump of trees.

Fig. 100: Warfare in Salt-Marshes

Warfare in Flat Country

Here, Sun Tzu uses some opposites:

- **Pairs of Opposites** in *Warfare in Flat Country*
  - Par. 9: **front** and **rear**.
  - Par. 9: **danger** and **safety**.

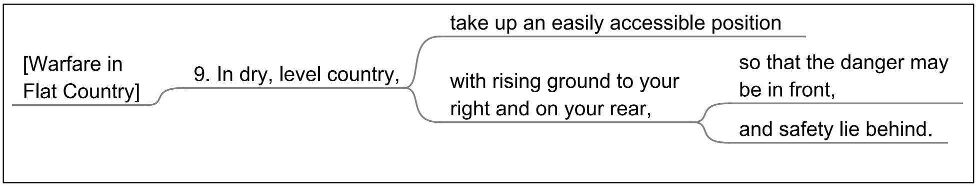

[Warfare in Flat Country]
9. In dry, level country,
take up an easily accessible position
with rising ground to your right and on your rear,
so that the danger may be in front,
and safety lie behind.

Fig. 101: Warfare in Flat Country

- **Conditional Sentences** in *Four Useful Branches of Military Knowledge*
  - Par. 3: `After crossing a river,…`
    `Adv. => Adv.`
  - Par. 4: `When an invading force crosses a river…`
    `Conseq. => 2 Adv.`
  - Par. 5-6: `If you are anxious to fight,…`
    `(Cond. => Adv., Adv., Adv.);` 也 indicates the essence of the sentence.
  - Par. 7-8: `In crossing salt-marshes,…`
    `2 (Cond. => Cond)` ; 也 indicates the essence of the sentence.
  - Par. 9: `In dry, level country,…` `Cond. => Adv.` ; 也 indicates the essence of the sentence.
  - Par. 10: `These are the four useful branches…`Universal quantification 凡; 也 indicates the essence of the sentence.

Preferences

When Sun Tzu talks about preferences, see figure: 102, he mentions several pairs of opposites.

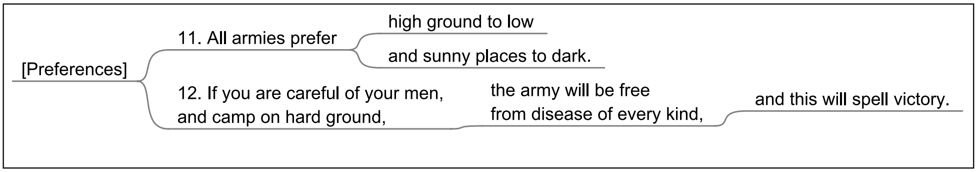

[Preferences]
11. All armies prefer
high ground to low
and sunny places to dark.
12. If you are careful of your men, and camp on hard ground,
the army will be free from disease of every kind,
and this will spell victory.

Fig. 102: Preferences

- **Pairs of Opposites** in *Preferences*
  - Par. 11: **high ground and low, sunny places or dark**.

- **Conditional Sentences** in *Preferences*
  - Par. 11: `All armies prefer`…Universal quantification 凡.
  - Par. 12: `If you are careful of your men,`… `2 Adv. => 2 Conseq` .

Terrain Type

This section is detailed in figure: 103. We see an implicit *Enumeration*: Hill or Bank, Swollen River and Dangerous Ground.

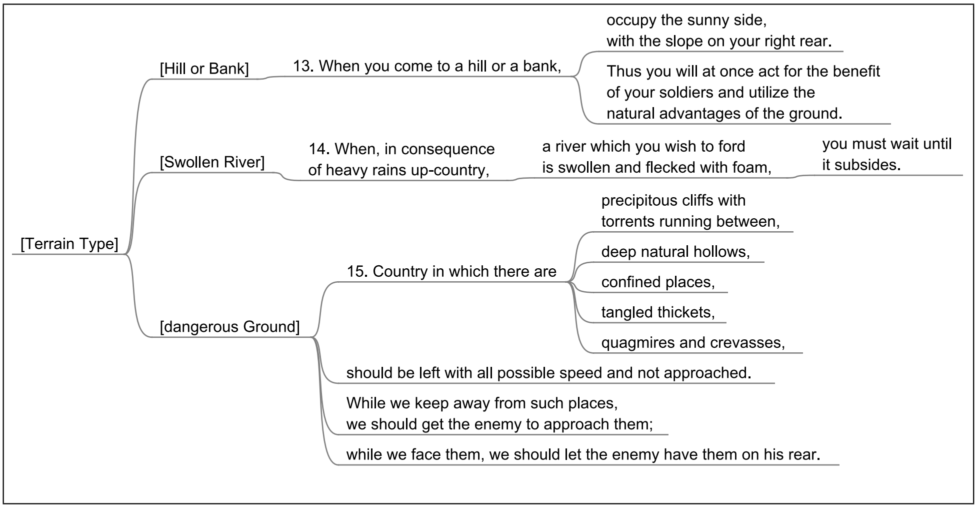

[Terrain Type]
[Hill or Bank]
13. When you come to a hill or a bank,
occupy the sunny side, with the slope on your right rear.
Thus you will at once act for the benefit of your soldiers and utilize the natural advantages of the ground.
[Swollen River]
14. When, in consequence of heavy rains up-country,
a river which you wish to ford is swollen and flecked with foam,
you must wait until it subsides.
[dangerous Ground]
15. Country in which there are
precipitous cliffs with torrents running between,
deep natural hollows,
confined places,
tangled thickets,
quagmires and crevasses,
should be left with all possible speed and not approached.
While we keep away from such places, we should get the enemy to approach them;
while we face them, we should let the enemy have them on his rear.

Fig. 103: Terrain Type

- **Conditional Sentences** in *Terrain Type*
  - Par. 13: `When you come to a hill or a bank,…` `Conseq. => Adv.` ; closed by 也.
  - Par. 14: `When, in consequence of heavy rains up-country,…` `Conseq. => Adv.` ; closed by 也.
  - Par. 15: `Country in which there are…` `Cond. => - Adv.` ; closed by 也.

Neighborhood

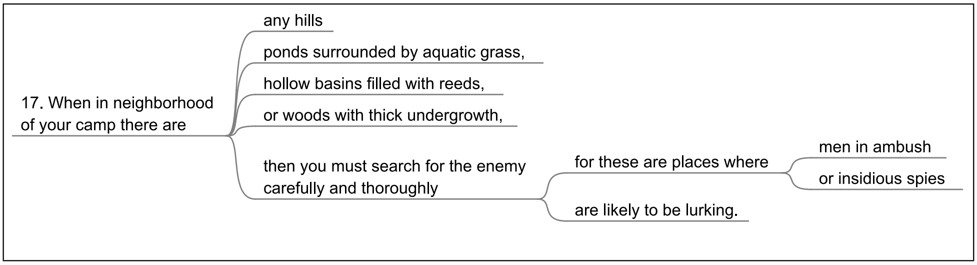

17. When in neighborhood of your camp there are
any hills
ponds surrounded by aquatic grass,
hollow basins filled with reeds,
or woods with thick undergrowth,
then you must search for the enemy carefully and thoroughly
for these are places where
men in ambush
or insidious spies
are likely to be lurking.

Fig. 104: Neighborhood

- **Pairs of Opposites** in *Neighborhood*
  - Par. 16: Keep **away** and **approach**; **face** and **rear**.
  - Par. 23: **High and low**.
  - Par. 24: **humble words and violent language**.
  - Par. 28: **advancing and retreating**.
  - Par. 43: **Humanity, and iron discipline**.

- **Conditional Sentences** in *Neighborhood*
  - Par. 16: `While we keep away from such places,…` `2 (Cond. => Adv.)` , see: Terrain Type, on page 258.
  - Par. 17: `When in neighborhood of your camp there are…` `Cond. => Adv.` ; closed by 也.
  - Par. 18-38: `When the enemy is…` A series of reversed implications, indicated by 也.

Circumstances

A major subject in this chapter is Sun Tzu's long list of circumstances and what to do for each. The conditions are all related to the position of the enemy and to enemy behavior.

Enemy Position

The enemy position is subdivided in several categories: location, nature and dust.

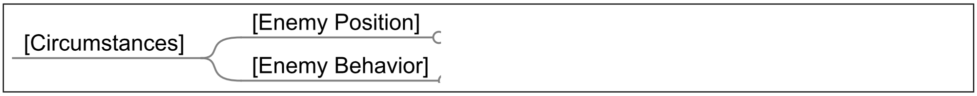

[Circumstances]
[Enemy Position]
[Enemy Behavior]

Fig. 105: Circumstances

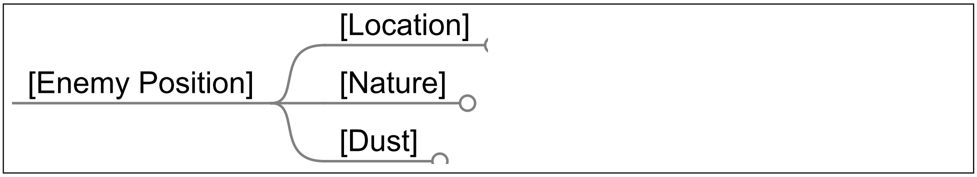

[Enemy Position]
[Location]
[Nature]
[Dust]

Fig. 106: Location

- **Pairs of Opposites** in *Enemy Position*
  - Par. 23: **High and low**.

Location

Location is the place where the enemy can be found relative to your own position.

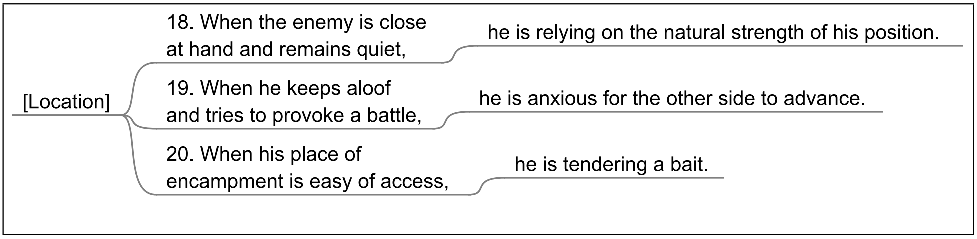

[Location]
18. When the enemy is close at hand and remains quiet,
he is relying on the natural strength of his position.
19. When he keeps aloof and tries to provoke a battle,
he is anxious for the other side to advance.
20. When his place of encampment is easy of access,
he is tendering a bait.

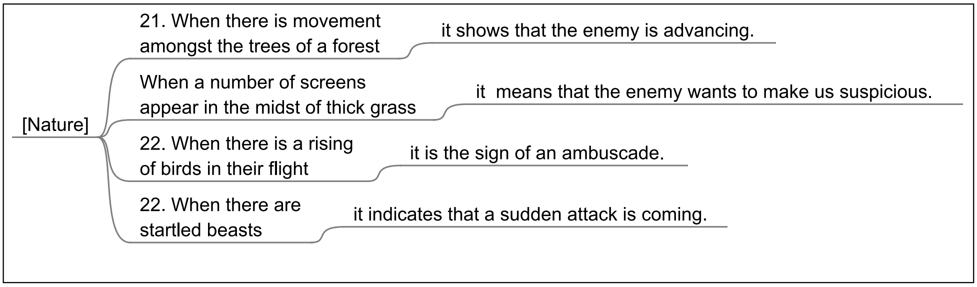
Fig. 107: Location

Nature

Nature talks about bush, birds and beasts, that indicate what the enemy may be doing or planning.

Dust

For the modern reader, dust may need some explanation. 2500 years ago, it would be more understandable: dust would betray the location of the enemy and the shape or movement of a dust cloud could tell something about the intentions of the enemy.



[Nature]

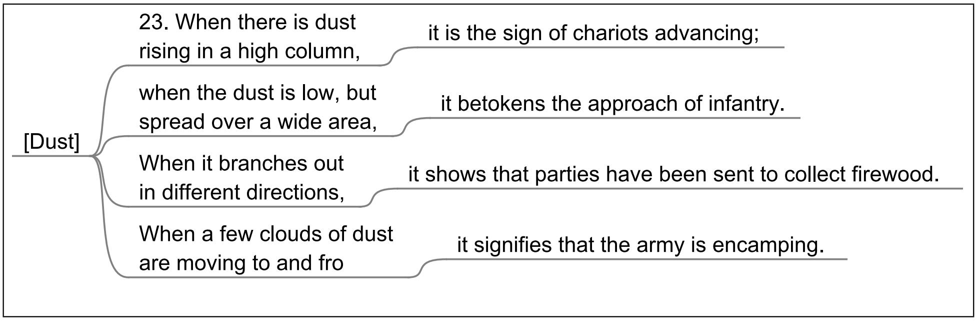
21. When there is movement amongst the trees of a forest it shows that the enemy is advancing.

When a number of screens appear in the midst of thick grass it means that the enemy wants to make us suspicious.

22. When there is a rising of birds in their flight it is the sign of an ambuscade.

22. When there are startled beasts it indicates that a sudden attack is coming.

Fig. 108: Nature



[Dust]

23. When there is dust rising in a high column, it is the sign of chariots advancing;

when the dust is low, but spread over a wide area, it betokens the approach of infantry.

When it branches out in different directions, it shows that parties have been sent to collect firewood.

When a few clouds of dust are moving to and fro it signifies that the army is encamping.

Fig. 109: Dust

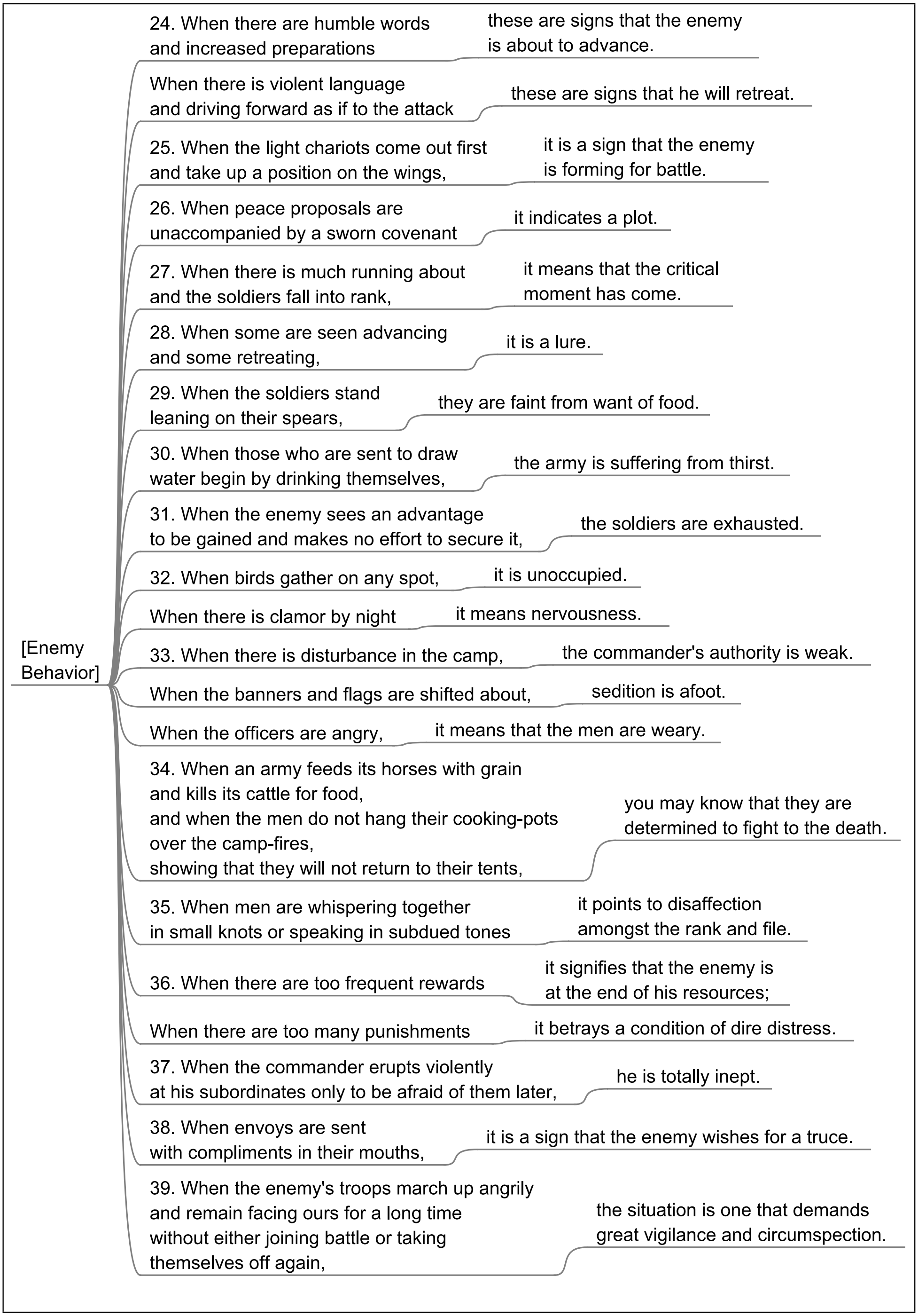
Enemy Behavior

The enemy behavior subject involves a long list of conditional sentences. In the Chinese text, each of these sentences ends with 也 Most of them were already in the form *When … it is …* in the Giles translation, the few that were not, usually in the form of *if …*, were changed to *when*, show the list more clearly.

A controversial conditional statement is in par. 37, where Giles says:

> 37. To begin by bluster, but afterwards to take fright at the enemy’s numbers, shows a supreme lack of intelligence.

We changed the translation of “bluster” to “bragging”, which seems more understandable to a reader of today. A study of other translations of this paragraph revealed that it is unclear whether Sun Tzu is talking about a large number of the enemy’s own troops or the troops of the enemy’s enemy (your troops therefore).



[Enemy Behavior]

24. When there are humble words and increased preparations	these are signs that the enemy is about to advance.
When there is violent language and driving forward as if to the attack	these are signs that he will retreat.
25. When the light chariots come out first and take up a position on the wings,	it is a sign that the enemy is forming for battle.
26. When peace proposals are unaccompanied by a sworn covenant	it indicates a plot.
27. When there is much running about and the soldiers fall into rank,	it means that the critical moment has come.
28. When some are seen advancing and some retreating,	it is a lure.
29. When the soldiers stand leaning on their spears,	they are faint from want of food.
30. When those who are sent to draw water begin by drinking themselves,	the army is suffering from thirst.
31. When the enemy sees an advantage to be gained and makes no effort to secure it,	the soldiers are exhausted.
32. When birds gather on any spot,	it is unoccupied.
When there is clamor by night	it means nervousness.
33. When there is disturbance in the camp,	the commander's authority is weak.
When the banners and flags are shifted about,	sedition is afoot.
When the officers are angry,	it means that the men are weary.
34. When an army feeds its horses with grain and kills its cattle for food, and when the men do not hang their cooking-pots over the camp-fires, showing that they will not return to their tents,	you may know that they are determined to fight to the death.
35. When men are whispering together in small knots or speaking in subdued tones	it points to disaffection amongst the rank and file.
36. When there are too frequent rewards	it signifies that the enemy is at the end of his resources;
When there are too many punishments	it betrays a condition of dire distress.
37. When the commander erupts violently at his subordinates only to be afraid of them later,	he is totally inept.
38. When envoys are sent with compliments in their mouths,	it is a sign that the enemy wishes for a truce.
39. When the enemy's troops march up angrily and remain facing ours for a long time without either joining battle or taking themselves off again,	the situation is one that demands great vigilance and circumspection.

Fig. 110: Enemy Behavior

- **Conditional Sentences** in *Circumstances*

  - Par. 18-38: `When the enemy is close at hand…`
    A series of reversed implications, indicated by 也
  - Par. 39: `When the enemy's troops march up angrily…`
    `Consd. => Judge.`

- **Pairs of Opposites** in *Enemy Behavior*
  - Par. 24: **humble words and violent language**.
  - Par. 28: **advancing and retreating**.

Commanding

The art of commanding involves *strength, punishment and discipline.*

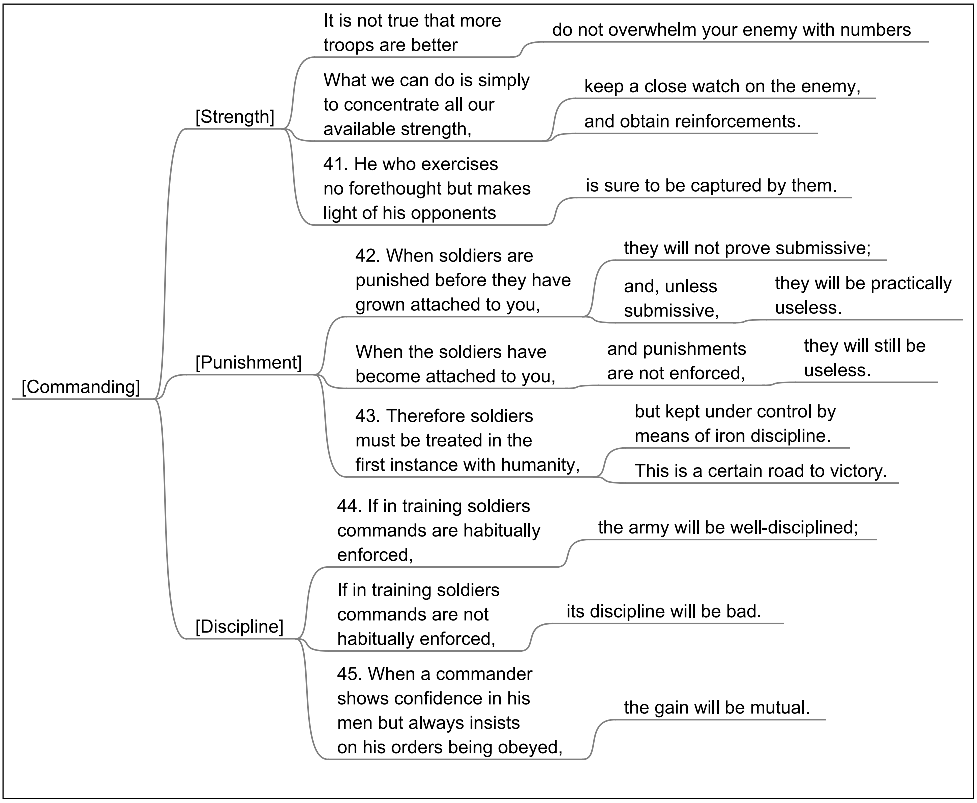

[Commanding]
[Strength]
It is not true that more troops are better
do not overwhelm your enemy with numbers
What we can do is simply to concentrate all our available strength,
keep a close watch on the enemy,
and obtain reinforcements.
41. He who exercises no forethought but makes light of his opponents
is sure to be captured by them.
[Punishment]
42. When soldiers are punished before they have grown attached to you,
they will not prove submissive;
and, unless submissive,
they will be practically useless.
When the soldiers have become attached to you,
and punishments are not enforced,
they will still be useless.
43. Therefore soldiers must be treated in the first instance with humanity,
but kept under control by means of iron discipline.
This is a certain road to victory.
[Discipline]
44. If in training soldiers commands are habitually enforced,
the army will be well-disciplined;
If in training soldiers commands are not habitually enforced,
its discipline will be bad.
45. When a commander shows confidence in his men but always insists on his orders being obeyed,
the gain will be mutual.

Fig. 111: Commanding

- **Pair of Opposites** in *Commanding*
  - 43: **Humanity, and iron discipline**.

- **Conditional Sentences** in *Commanding*
  - Par. 40: `If our troops are no more in number…`
    `Cond. => Judge.` ; affirmed by 也
  - Par. 41: `He who exercises no forethought…`
    `Cond. => Conseq.`
  - Par. 42: `If soldiers are punished…`
    `Cond. , Adv. => Cond., Judge.` ; affirmed by 也;
  - Par. 43: `Therefore soldiers must be treated…`
    `=> Judge. (故)` .
  - Par. 44: `If in training soldiers…`
    `(Adv. | Conseq. | Conseq.)` .
  - Par. 45: `When a commander shows confidence…`
    `2 Adv. => Judge.` ; affirmed by 也.

Structured Text

IX. THE ARMY ON THE MARCH

- **1. Sun Tzu Said:**
  We come now to the question of
  - » encamping the army,
  - » and observing signs of the enemy.
- **Four Useful Branches of Military Knowledge**
  [Mountain Warfare]
  - » Pass quickly over mountains,
  - » and keep in the neighborhood of valleys.
  - » 2. Camp in high places, facing the sun.
  - » Do not climb heights in order to fight.

  [River Warfare]
  - » 3. After crossing a river, you should get far away from it.
  - » 4. When an invading force crosses a river in its onward march,
    - ° do not advance to meet it in mid-stream.
    - ° It will be best to let half the army get across,
      - - and then deliver your attack.
  - » 5. If you are anxious to fight,
    - ° you should not go to meet the invader near a river which he has to cross.
    - ° 6. Moor your craft higher up than the enemy,
      - - and facing the sun.
    - ° Do not move up-stream to meet the enemy.

  [Warfare in Salt-Marshes]
  - » 7. In crossing salt-marshes, your sole concern should be
    - ° to get over them quickly, without any delay.
  - » 8. If forced to fight in a salt-marsh,
    - ° you should have water and grass near you,
    - ° and get your back to a clump of trees.

  [Warfare in Flat Country]
  - » 9. In dry, level country,
    - ° take up an easily accessible position
    - ° with rising ground to your right and on your rear,
      - - so that the danger may be in front,
      - - and safety lie behind.

  10. These are the four useful branches of military knowledge which enabled the Yellow Emperor to completely defeat four several sovereigns.
- **Preferences**
  11. All armies prefer
  - » high ground to low
  - » and sunny places to dark.

  12. If you are careful of your men, and camp on hard ground,
  - » the army will be free from disease of every kind,
    - ° and this will spell victory.

- **Terrain Type**

  [Hill or Bank]
  - » 13. When you come to a hill or a bank,
    - ° occupy the sunny side, with the slope on your right rear.
    - ° Thus you will at once act for the benefit of your soldiers and utilize the natural advantages of the ground.

  [Swollen River]
  - » 14. When, in consequence of heavy rains up-country,
    - ° a river which you wish to ford is swollen and flecked with foam,
      - - you must wait until it subsides.

  [Dangerous Ground]
  - » 15. Country in which there are
    - ° precipitous cliffs with torrents running between,
    - ° deep natural hollows,
    - ° confined places,
    - ° tangled thickets,
    - ° quagmires and crevasses,
  - » should be left with all possible speed and not approached.
  - » 16. While we keep away from such places, we should get the enemy to approach them;
  - » while we face them, we should let the enemy have them on his rear.

- **Neighborhood**

  17. When in neighborhood of your camp there are
  - » any hills
  - » ponds surrounded by aquatic grass,
  - » hollow basins filled with reeds,
  - » or woods with thick undergrowth,
  - » then you must search for the enemy carefully and thoroughly
    - ° for these are places where
      - - men in ambush
      - - or insidious spies
    - ° are likely to be lurking.

- **Circumstances**

  [Enemy Position]
  - » [Location]
    - ° 18. When the enemy is close at hand and remains quiet,
      - - he is relying on the natural strength of his position.
    - ° 19. When he keeps aloof and tries to provoke a battle,
      - - he is anxious for the other side to advance.
    - ° 20. When his place of encampment is easy of access,
      - - he is tendering a bait.
  - » [Nature]

```
    ° 21. When there is movement amongst the trees of a
      forest
      - it shows that the enemy is advancing.
    ° When a number of screens appear in the midst of
      thick grass
      - it  means that the enemy wants to make us
        suspicious.
    ° 22. When there is a rising of birds in their
      flight
      - it is the sign of an ambuscade.
    ° 22. When there are startled beasts
      - it indicates that a sudden attack is coming.
  » [Dust]
    ° 23. When there is dust rising in a high column,
      - it is the sign of chariots advancing;
    ° When the dust is low, but spread over a wide
      area,
      - it betokens the approach of infantry.
    ° When it branches out in different directions,
      - it shows that parties have been sent to collect
        firewood.
    ° When a few clouds of dust moving to and fro
      - it signifies that the army is encamping.
[Enemy Behavior]
  » 24. When there are humble words and increased
    preparations
    ° these are signs that the enemy is about to
      advance.
  » When there is violent language and driving forward
    as if to the attack
    ° these are signs that he will retreat.
  » 25. When the light chariots come out first and take
    up a position on the wings,
    ° it is a sign that the enemy is forming for
      battle.
  » 26. When peace proposals are unaccompanied by a
    sworn covenant
    ° it indicates a plot.
  » 27. When there is much running about and the
    soldiers fall into rank,
    ° it means that the critical moment has come.
  » 28. When some are seen advancing and some
    retreating,
    ° it is a lure.
  » 29. When the soldiers stand leaning on their
    spears,
    ° they are faint from want of food.
  » 30. When those who are sent to draw water begin by
    drinking themselves,
    ° the army is suffering from thirst.
  » 31. When the enemy sees an advantage to be gained
    and makes no effort to secure it,
    ° the soldiers are exhausted.
  » 32. When birds gather on any spot,
```

- ° it is unoccupied.
- » When there is clamor by night
  - ° it means nervousness.
- » 33. When there is disturbance in the camp,
  - ° the commanders authority is weak.
- » When the banners and flags are shifted about,
  - ° sedition is afoot.
- » When the officers are angry,
  - ° it means that the men are weary.
- » 34. When an army feeds its horses with grain and kills its cattle for food, and when the men do not hang their cooking-pots over the camp-fires, showing that they will not return to their tents,
  - ° you may know that they are determined to fight to the death.
- » 35. When men are whispering together in small knots or speaking in subdued tones
  - ° it points to disaffection amongst the rank and file.
- » 36. When there are too frequent rewards
  - ° it signifies that the enemy is at the end of his resources;
- » When there are too many punishments
  - ° it betrays a condition of dire distress.
- » 37. When the commander erupts violently at his subordinates only to be afraid of them later,
  - ° he is totally inept.
- » 38. When envoys are sent with compliments in their mouths,
  - ° it is a sign that the enemy wishes for a truce.
- » 39. When the enemy's troops march up angrily and remain facing ours for a long time without either joining battle or taking themselves off again,
  - ° the situation is one that demands great vigilance and circumspection.

- **Commanding**

  [Strength]
  - » It is not true that more troops are better
    - ° do not overwhelm your enemy with numbers
  - » What we can do is simply to concentrate all our available strength,
    - ° keep a close watch on the enemy,
    - ° and obtain reinforcements.
  - » 41. He who exercises no forethought but makes light of his opponents
    - ° is sure to be captured by them.

  [Punishment]
  - » 42. When soldiers are punished before they have grown attached to you,
    - ° they will not prove submissive;
    - ° and, unless submissive,
      - - they will be practically useless.
  - » When the soldiers have become attached to you,

```
    ° and punishments are not enforced,
      - they will still be useless.
  » 43. Therefore soldiers must be treated in the first
    instance with humanity,
    ° but kept under control by means of iron
      discipline.
    ° This is a certain road to victory.
[Discipline]
  » 44. If in training soldiers commands are habitually
    enforced,
    ° the army will be well-disciplined;
  » If in training soldiers commands are not habitually
    enforced,
    °  its discipline will be bad.
  » 45. When a commander shows confidence in his men
    but always insists on his orders being obeyed,
    ° the gain will be mutual.
```

X. TERRAIN - 地形

Abstract As the title suggests, this chapter handles terrain, six kinds of terrain as enumerated by Sun Tzu. Concerning the patterns in this chapter: we see a number of pairs of opposites, describing enemy circumstances or positions contrasted with your own.

Guan Yu flooding seven divisions of the enemy.

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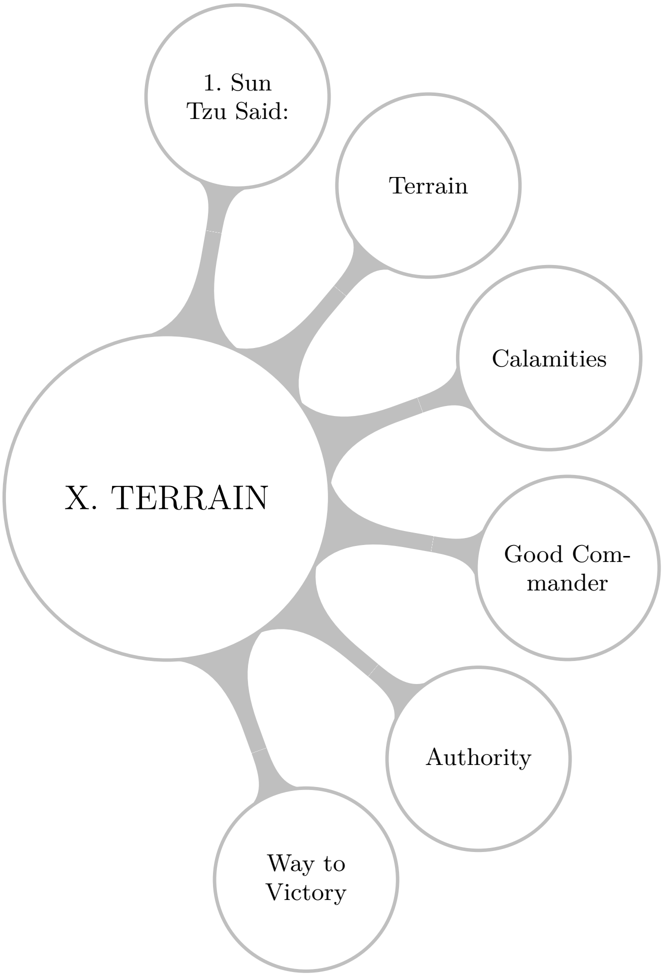
P. van Emde Boas et al., *Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps*, Logic in Asia: Studia Logica Library,
https://doi.org/10.1007/978-981-19-6250-9_20

Main Concepts


1. Sun Tzu Said:
Terrain
Calamities
X. TERRAIN
Good Commander
Authority
Way to Victory

As the title suggests, this chapter handles terrain.

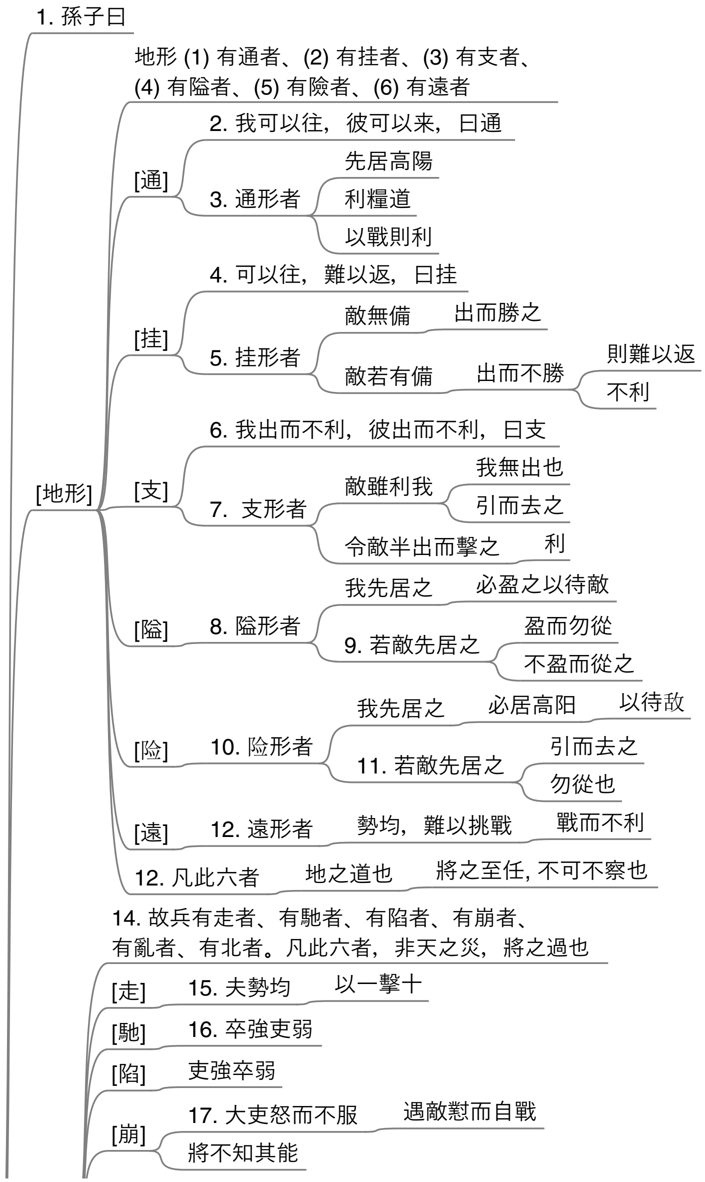
In paragraph 1, Sun Tzu Said: We may distinguish six kinds of terrain, followed by an enumeration of the various types, their definitions and what to watch out for concerning the enemy.

The next chapter, AoW chapter XI, will again talk about different types of terrain, somewhat repetitious. However, in this chapter the description is more situational. The chapter ends with another famous quote:

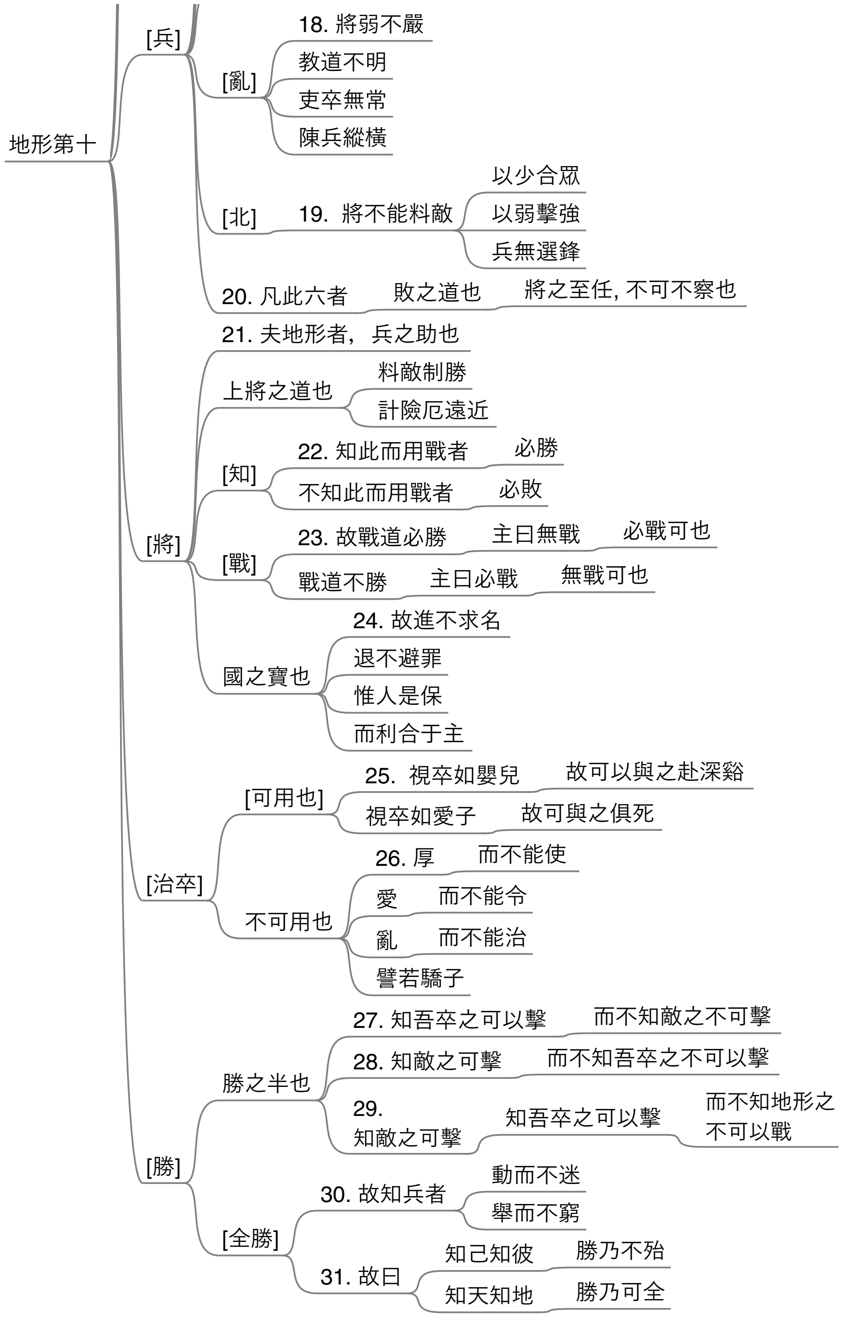
If you know the enemy and know yourself, your victory will not stand in doubt; if you know Heaven and know Earth, you may make your victory complete.

Mind Maps

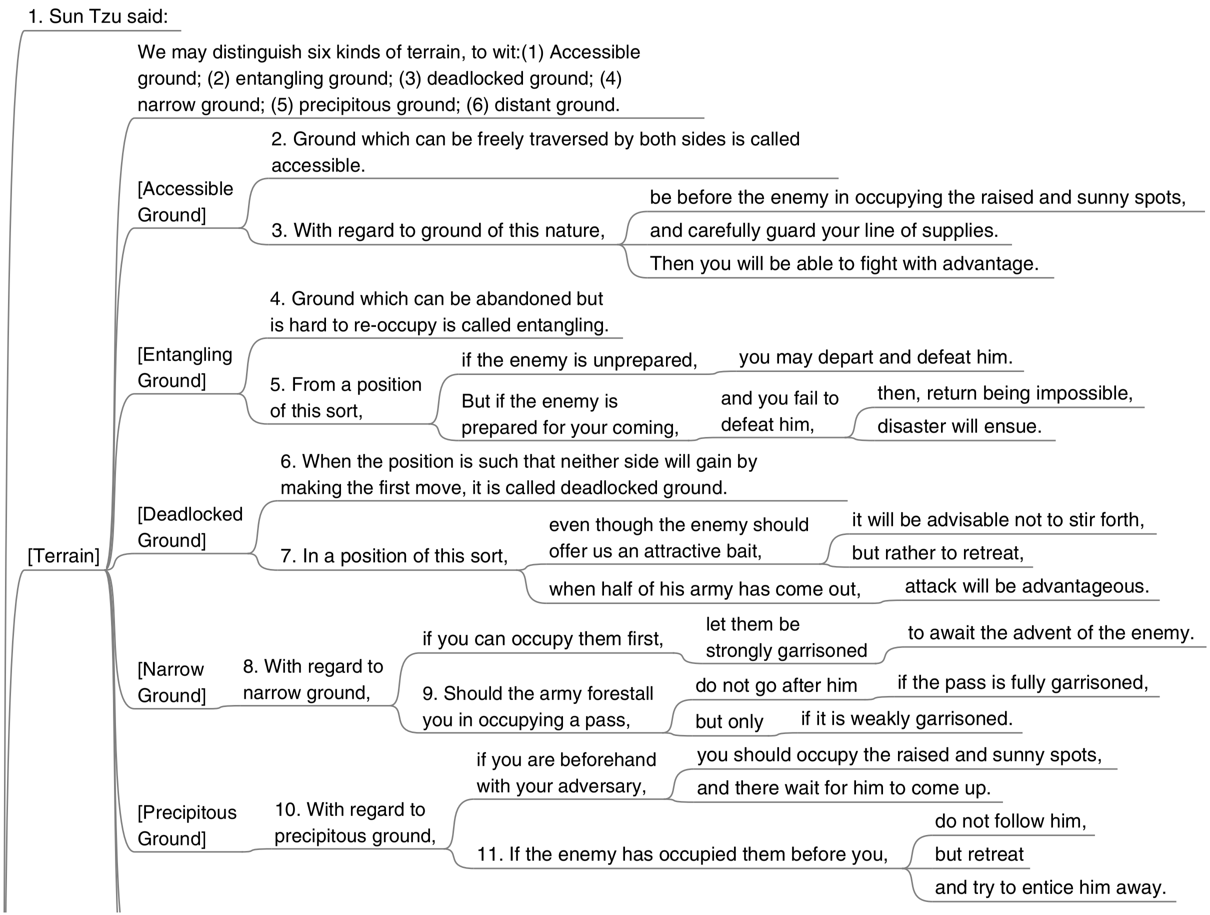
The overview for this chapter can be found in mind map figures 47 to 51.


1. 孫子曰
[地形]
地形 (1) 有通者、(2) 有挂者、(3) 有支者、
(4) 有隘者、(5) 有險者、(6) 有遠者
[通]
2. 我可以往，彼可以来，曰通
3. 通形者
先居高陽
利糧道
以戰則利
[挂]
4. 可以往，難以返，曰挂
5. 挂形者
敵無備
出而勝之
敵若有備
出而不勝
則難以返
不利
[支]
6. 我出而不利，彼出而不利，曰支
7. 支形者
敵雖利我
我無出也
引而去之
令敵半出而擊之
利
[隘]
8. 隘形者
我先居之
必盈之以待敵
9. 若敵先居之
盈而勿從
不盈而從之
[险]
10. 险形者
我先居之
必居高阳
以待敌
11. 若敵先居之
引而去之
勿從也
[遠]
12. 遠形者
勢均，難以挑戰
戰而不利
12. 凡此六者
地之道也
將之至任, 不可不察也
14. 故兵有走者、有馳者、有陷者、有崩者、
有亂者、有北者。凡此六者，非天之災，將之過也
[走]
15. 夫勢均
以一擊十
[馳]
16. 卒強吏弱
[陷]
吏強卒弱
[崩]
17. 大吏怒而不服
遇敵懟而自戰
將不知其能

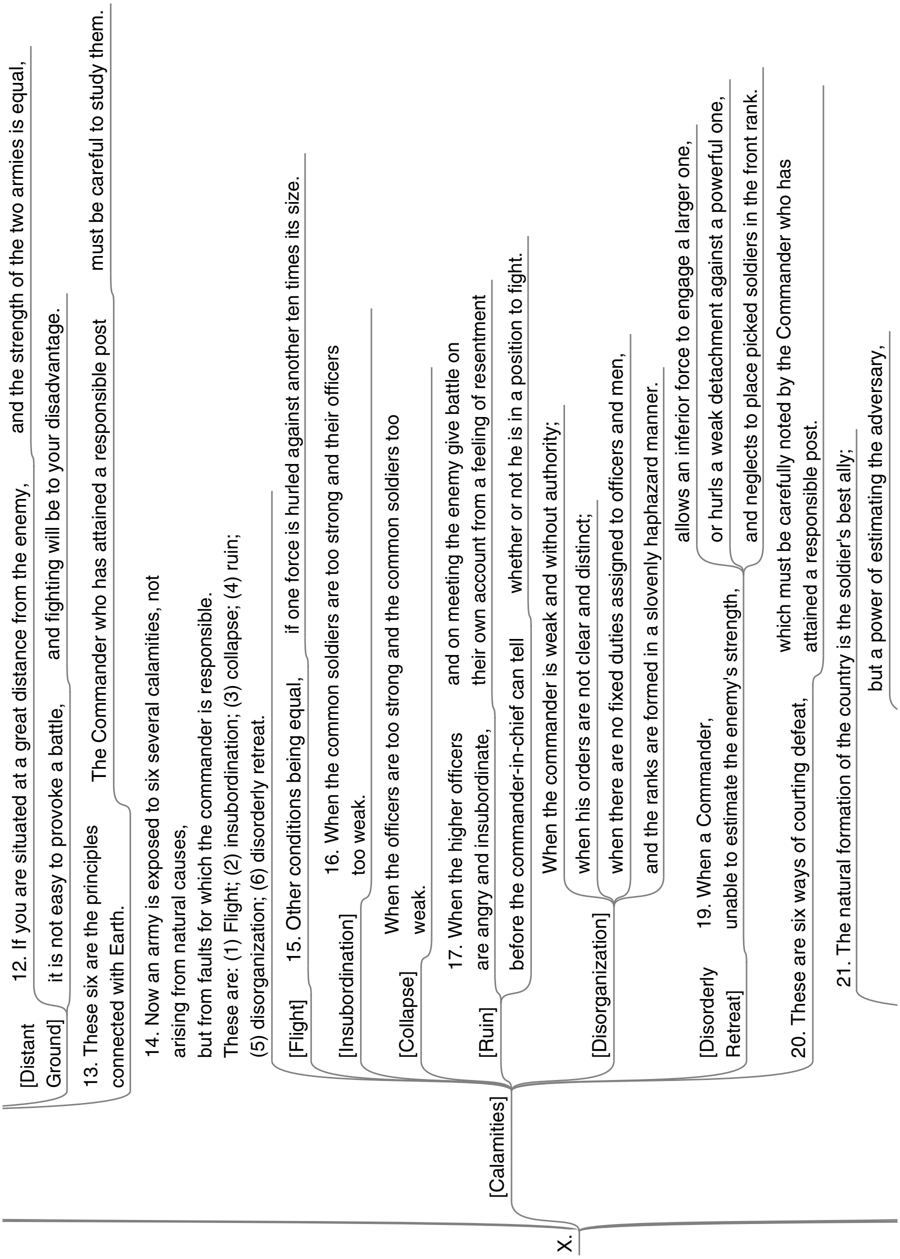
Mind Map 47: AoW Chapter X - Part 1


地形第十
[兵]
[亂]
18. 將弱不嚴
教道不明
吏卒無常
陳兵縱橫
[北]
19. 將不能料敵
以少合眾
以弱擊強
兵無選鋒
20. 凡此六者
敗之道也
將之至任, 不可不察也
[將]
21. 夫地形者，兵之助也
上將之道也
料敵制勝
計險厄遠近
[知]
22. 知此而用戰者
必勝
不知此而用戰者
必敗
[戰]
23. 故戰道必勝
主曰無戰
必戰可也
戰道不勝
主曰必戰
無戰可也
國之寶也
24. 故進不求名
退不避罪
惟人是保
而利合于主
[治卒]
[可用也]
25. 視卒如嬰兒
故可以與之赴深谿
視卒如愛子
故可與之俱死
不可用也
26. 厚
而不能使
愛
而不能令
亂
而不能治
譬若驕子
[勝]
勝之半也
27. 知吾卒之可以擊
而不知敵之不可擊
28. 知敵之可擊
而不知吾卒之不可以擊
29. 知敵之可擊
知吾卒之可以擊
而不知地形之 不可以戰
[全勝]
30. 故知兵者
動而不迷
舉而不窮
31. 故曰
知己知彼
勝乃不殆
知天知地
勝乃可全

Mind Map 48: AoW Chapter X - Part 2


1. Sun Tzu said:
We may distinguish six kinds of terrain, to wit:(1) Accessible ground; (2) entangling ground; (3) deadlocked ground; (4) narrow ground; (5) precipitous ground; (6) distant ground.
[Terrain]
[Accessible Ground]
2. Ground which can be freely traversed by both sides is called accessible.
3. With regard to ground of this nature,
be before the enemy in occupying the raised and sunny spots,
and carefully guard your line of supplies.
Then you will be able to fight with advantage.
[Entangling Ground]
4. Ground which can be abandoned but is hard to re-occupy is called entangling.
5. From a position of this sort,
if the enemy is unprepared,
you may depart and defeat him.
But if the enemy is prepared for your coming,
and you fail to defeat him,
then, return being impossible,
disaster will ensue.
[Deadlocked Ground]
6. When the position is such that neither side will gain by making the first move, it is called deadlocked ground.
7. In a position of this sort,
even though the enemy should offer us an attractive bait,
it will be advisable not to stir forth,
but rather to retreat,
when half of his army has come out,
attack will be advantageous.
[Narrow Ground]
8. With regard to narrow ground,
if you can occupy them first,
let them be strongly garrisoned
to await the advent of the enemy.
9. Should the army forestall you in occupying a pass,
do not go after him
if the pass is fully garrisoned,
but only
if it is weakly garrisoned.
[Precipitous Ground]
10. With regard to precipitous ground,
if you are beforehand with your adversary,
you should occupy the raised and sunny spots,
and there wait for him to come up.
11. If the enemy has occupied them before you,
do not follow him,
but retreat
and try to entice him away.

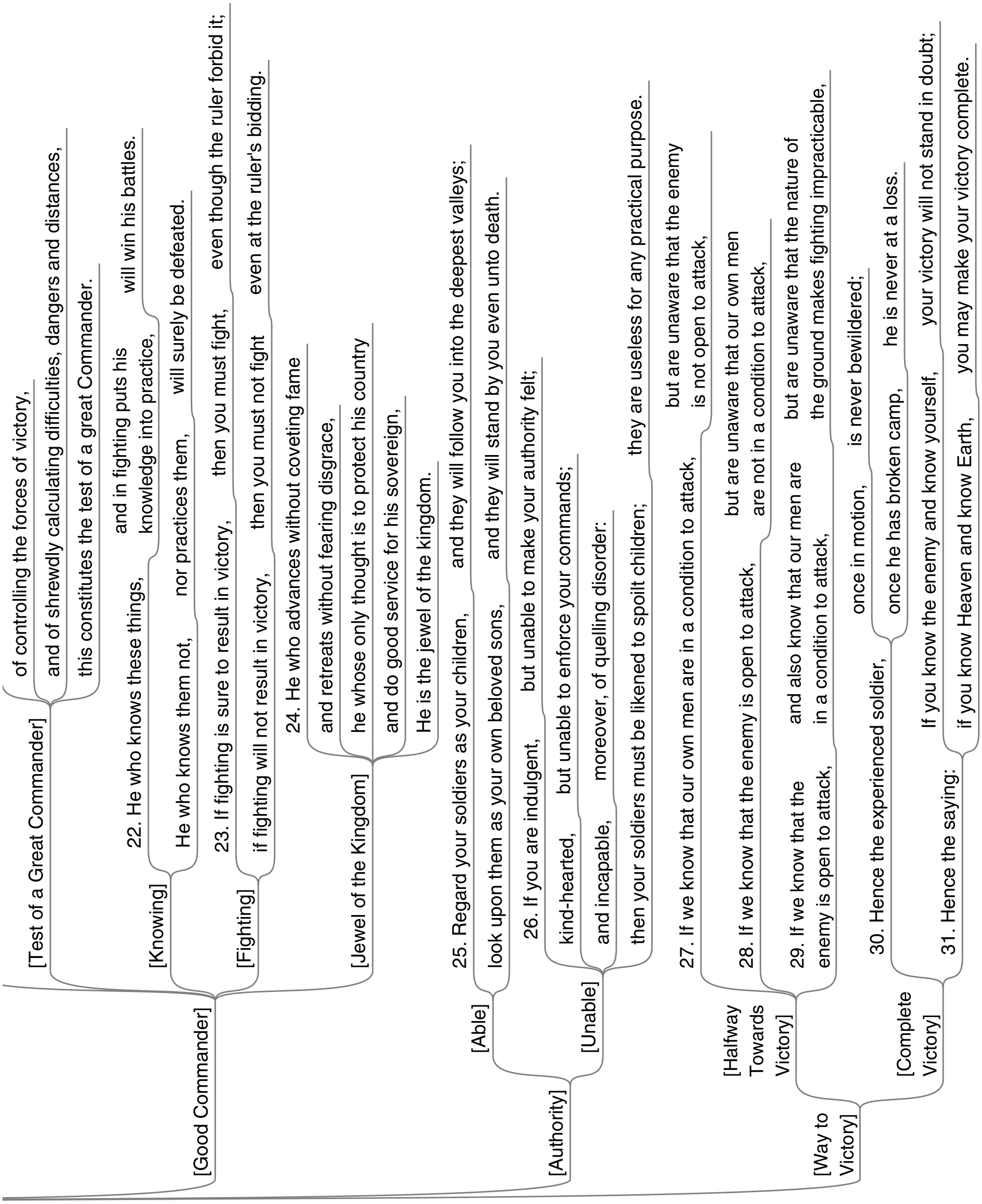
Mind Map 49: AoW Chapter X - TERRAIN - Part 1



X.

- [Distant Ground]
  - 12. If you are situated at a great distance from the enemy,
    - and the strength of the two armies is equal,
  - it is not easy to provoke a battle,
    - and fighting will be to your disadvantage.
- 13. These six are the principles connected with Earth.
  - The Commander who has attained a responsible post
    - must be careful to study them.
- 14. Now an army is exposed to six several calamities, not arising from natural causes, but from faults for which the commander is responsible. These are: (1) Flight; (2) insubordination; (3) collapse; (4) ruin; (5) disorganization; (6) disorderly retreat.
- [Calamities]
  - [Flight]
    - 15. Other conditions being equal,
      - if one force is hurled against another ten times its size.
  - [Insubordination]
    - 16. When the common soldiers are too strong and their officers too weak.
  - [Collapse]
    - When the officers are too strong and the common soldiers too weak.
  - [Ruin]
    - 17. When the higher officers
      - and on meeting the enemy give battle on
    - are angry and insubordinate,
      - their own account from a feeling of resentment
    - before the commander-in-chief can tell
      - whether or not he is in a position to fight.
  - [Disorganization]
    - When the commander is weak and without authority;
    - when his orders are not clear and distinct;
    - when there are no fixed duties assigned to officers and men,
    - and the ranks are formed in a slovenly haphazard manner.
  - [Disorderly Retreat]
    - 19. When a Commander,
      - allows an inferior force to engage a larger one,
    - unable to estimate the enemy's strength,
      - or hurls a weak detachment against a powerful one,
      - and neglects to place picked soldiers in the front rank.
- 20. These are six ways of courting defeat,
  - which must be carefully noted by the Commander who has attained a responsible post.
- 21. The natural formation of the country is the soldier's best ally;
  - but a power of estimating the adversary,

Mind Map 50: AoW Chapter X - TERRAIN - Part 2


[Good Commander]
[Test of a Great Commander]
of controlling the forces of victory,
and of shrewdly calculating difficulties, dangers and distances,
this constitutes the test of a great Commander.
[Knowing]
22. He who knows these things,
and in fighting puts his knowledge into practice,
will win his battles.
He who knows them not,
nor practices them,
will surely be defeated.
[Fighting]
23. If fighting is sure to result in victory,
then you must fight,
even though the ruler forbid it;
if fighting will not result in victory,
then you must not fight
even at the ruler's bidding.
[Jewel of the Kingdom]
24. He who advances without coveting fame
and retreats without fearing disgrace,
he whose only thought is to protect his country
and do good service for his sovereign,
He is the jewel of the kingdom.
[Authority]
[Able]
25. Regard your soldiers as your children,
and they will follow you into the deepest valleys;
look upon them as your own beloved sons,
and they will stand by you even unto death.
[Unable]
26. If you are indulgent,
but unable to make your authority felt;
kind-hearted,
but unable to enforce your commands;
and incapable,
moreover, of quelling disorder:
then your soldiers must be likened to spoilt children;
they are useless for any practical purpose.
[Way to Victory]
[Halfway Towards Victory]
27. If we know that our own men are in a condition to attack,
but are unaware that the enemy is not open to attack,
28. If we know that the enemy is open to attack,
but are unaware that our own men are not in a condition to attack,
29. If we know that the enemy is open to attack,
and also know that our men are in a condition to attack,
but are unaware that the nature of the ground makes fighting impracticable,
[Complete Victory]
30. Hence the experienced soldier,
once in motion,
is never bewildered;
once he has broken camp,
he is never at a loss.
31. Hence the saying:
If you know the enemy and know yourself,
your victory will not stand in doubt;
if you know Heaven and know Earth,
you may make your victory complete.

Mind Map 51: AoW Chapter X - TERRAIN - Part 3

Details and Patterns

Sun Tzu defines various types of terrain. An overview of the use of *terrain* can be found here: Terrain, on page 397.

Sun Tzu Said:

This is a chapter about *terrain*. Sun Tzu describes their types here, but in later chapters he talks about terrain again, sometimes in a different setting and sometimes using other terminology. Also see: Terrain, on page 397.

Terrain

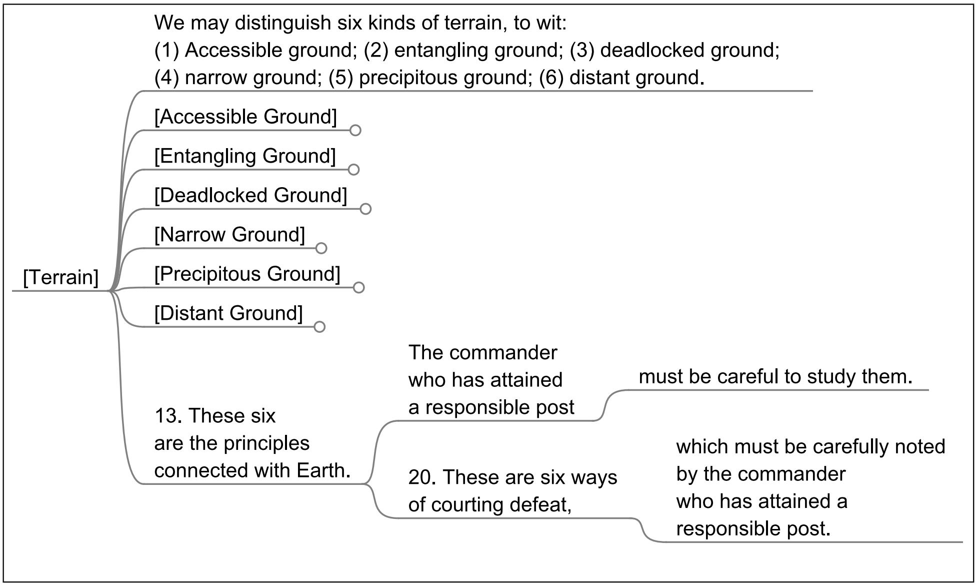

We may distinguish six kinds of terrain, to wit:
(1) Accessible ground; (2) entangling ground; (3) deadlocked ground;
(4) narrow ground; (5) precipitous ground; (6) distant ground.
[Accessible Ground]
[Entangling Ground]
[Deadlocked Ground]
[Narrow Ground]
[Terrain]
[Precipitous Ground]
[Distant Ground]
The commander who has attained a responsible post
must be careful to study them.
13. These six are the principles connected with Earth.
which must be carefully noted by the commander who has attained a responsible post.
20. These are six ways of courting defeat,

Fig. 112: Terrain

In section *Terrain*, there are descriptions of six types of terrain. Also, there is one pair of opposites.

- **Enumeration**
  - Par. 1: *Six Kinds of Terrain*: Accessible Ground, Entangling Ground, Deadlocked Ground, Narrow Ground, Precipitous Ground, Distant Ground.
- **Pairs of Opposites**
  - Par. 4-5: **unprepared, or prepared**.
- **Definitions**
  - Par. 2-6: See the list of terrains in the enumeration pattern in this section. `9 Def.`

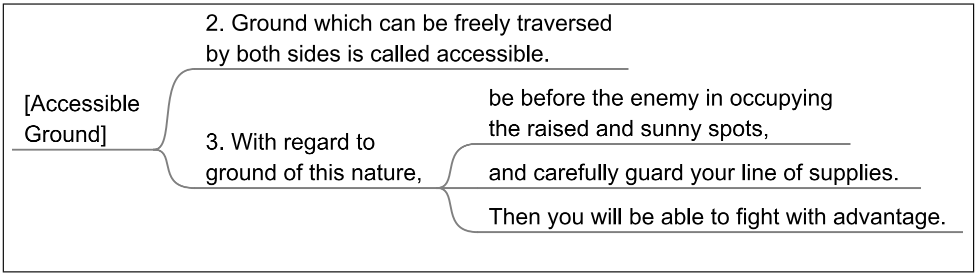

[Accessible Ground]
2. Ground which can be freely traversed by both sides is called accessible.
3. With regard to ground of this nature,
be before the enemy in occupying the raised and sunny spots,
and carefully guard your line of supplies.
Then you will be able to fight with advantage.

Fig. 113: Terrain - Accessible Ground

- **Conditional Sentences** in *Terrain - Accessible Ground*, see figure 113.
  - Par. 2-3: `Ground which can be freely traversed...`
    `2 Adv. => Conseq.` ;

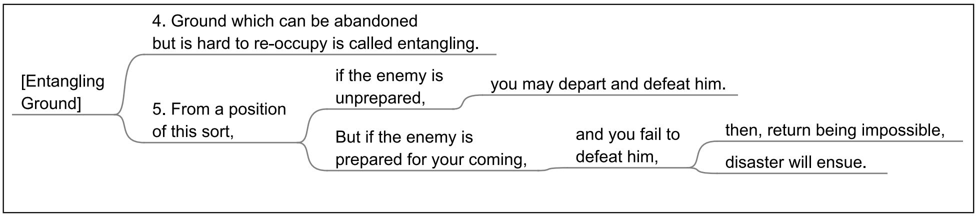

[Entangling Ground]
4. Ground which can be abandoned but is hard to re-occupy is called entangling.
5. From a position of this sort,
if the enemy is unprepared,
you may depart and defeat him.
But if the enemy is prepared for your coming,
and you fail to defeat him,
then, return being impossible,
disaster will ensue.

Fig. 114: Terrain - Entangling Ground

- **Conditional Sentences** in *Terrain - Entangling Ground*, see figure 114
  - Par. 4-5: `Ground which can be abandoned...`
    `Def., if-then-else: (Cond. => Adv., 2 Cond. => Conseq.)` ;

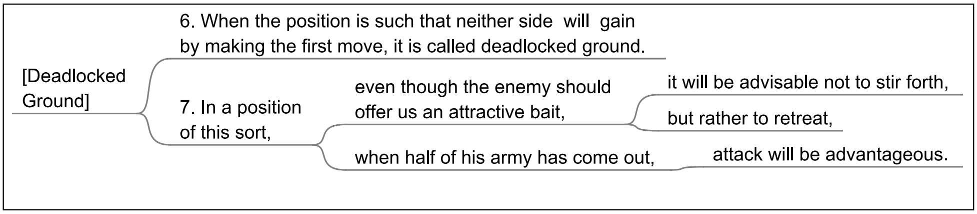

[Deadlocked Ground]
6. When the position is such that neither side will gain by making the first move, it is called deadlocked ground.
7. In a position of this sort,
even though the enemy should offer us an attractive bait,
it will be advisable not to stir forth,
but rather to retreat,
when half of his army has come out,
attack will be advantageous.

Fig. 115: Terrain - Deadlocked Ground

- **Conditional Sentences** in *Terrain - Deadlocked Ground*, see figure 115
  - Par. 6-7: `When the position is such that neither side...`
    `Def., 2 Cond. => Adv., Cond. => Adv.`

- **Conditional Sentences** in *Terrain - Narrow Ground*, see figure 116
  - Par. 8: `With regard to narrow ground,...`
    `Conseq. => 2 Adv.` ;
  - Par. 9: `Should the army forestall you...`
    `if-then-else: 2 Cod. => Adv.`

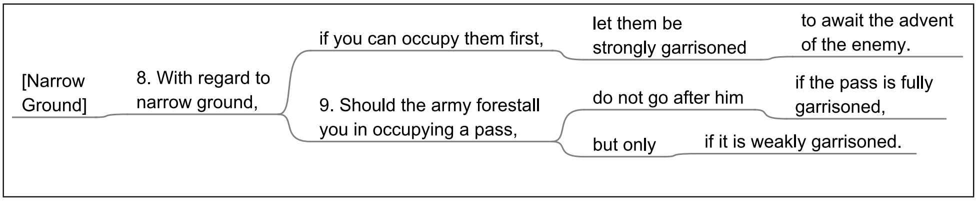

[Narrow Ground]
8. With regard to narrow ground,
if you can occupy them first,
let them be strongly garrisoned
to await the advent of the enemy.
9. Should the army forestall you in occupying a pass,
do not go after him
if the pass is fully garrisoned,
but only
if it is weakly garrisoned.

Fig. 116: Terrain - Narrow Ground

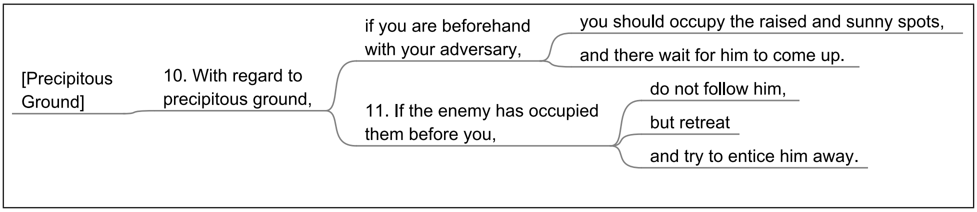

[Precipitous Ground]
10. With regard to precipitous ground,
if you are beforehand with your adversary,
you should occupy the raised and sunny spots,
and there wait for him to come up.
11. If the enemy has occupied them before you,
do not follow him,
but retreat
and try to entice him away.

Fig. 117: Terrain - Precipitous Ground

- **Conditional Sentences** in *Terrain - Precipitous Ground*, see figure 117
  - Par. 10: `With regard to precipitous ground,…`
    `Cond. => 2 Adv.` ;
  - Par. 11: `If the enemy has occupied them…`
    `Cond. => 3 Adv.`

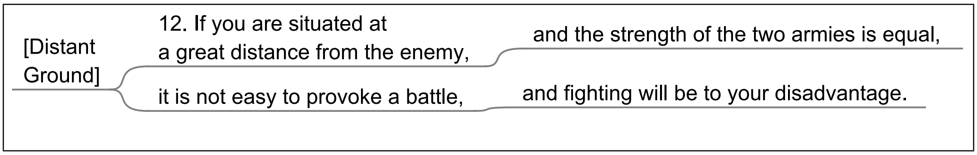

[Distant Ground]
12. If you are situated at a great distance from the enemy,
and the strength of the two armies is equal,
it is not easy to provoke a battle,
and fighting will be to your disadvantage.

Fig. 118: Terrain - Distant Ground

- **Conditional Sentences** in *Terrain - Distant Ground*, see figure 118
  - Par. 12: `If you are situated at a great distance…`
    `2 Cond. => 2 Judge.` ;

- **Conditional Sentence** in *Terrain*, see figure 112
  - Par. 13: `These six are the principles connected with Earth.…`
    Universal quantificatier 凡.

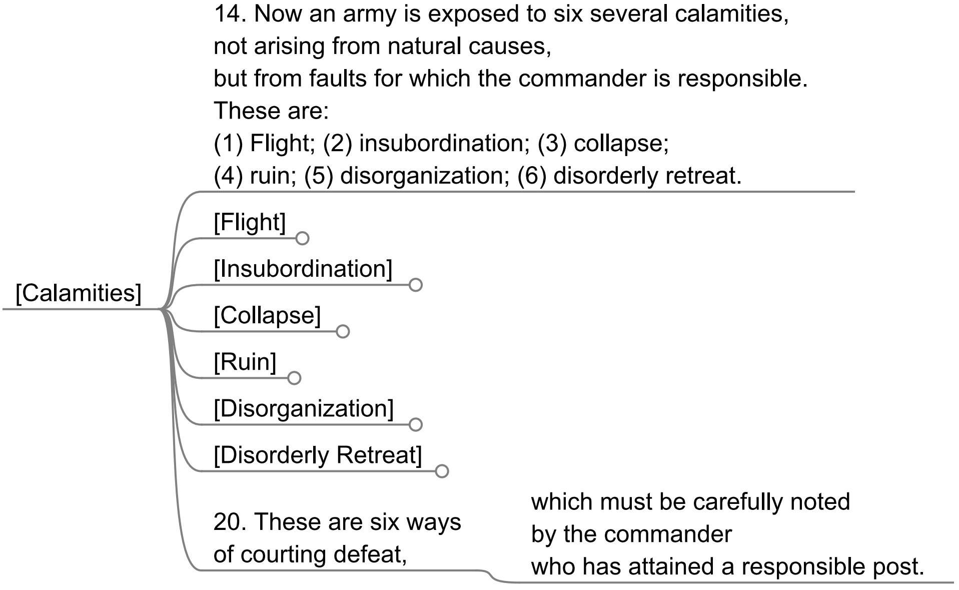
Calamities

In the section *Calamities* we find an *enumeration pattern*:

- **Enumeration**

  - Par. 14: *Six types of Calamities*: (1) Flight; (2) insubordination; (3) collapse; (4) ruin; (5) disorganization; (6) rout.

All of these are the responsibility of the commander.



14. Now an army is exposed to six several calamities, not arising from natural causes, but from faults for which the commander is responsible. These are: (1) Flight; (2) insubordination; (3) collapse; (4) ruin; (5) disorganization; (6) disorderly retreat.

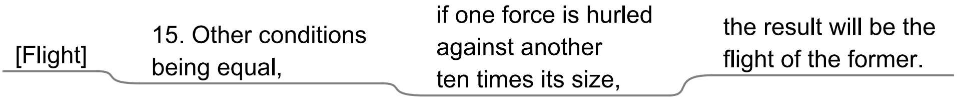
20. These are six ways of courting defeat, which must be carefully noted by the commander who has attained a responsible post.

Fig. 119: Calamities - Overview

In the next paragraphs, featuring *Clamities*, Sun Tzu describes for each calamity what can happen and why.

- **Pairs of Opposites** in *Calamities*
  - Par. 16: **soldiers strong and officers weak** or **officers strong and soldiers weak**.
  - Par. 19: **inferior force against a larger one**.

- **Conditional Sentences** in *Calamities - Overview*, see figure 119.
  - Par. 14: `Now an army is exposed to six several calamities,…`
    `=> Judge. (故)` ; Universal quantification with 凡
  - Par. 20: `These are six ways of courting defeat…`
    Universal quantification with 凡.



15. Other conditions being equal, if one force is hurled against another ten times its size, the result will be the flight of the former.

Fig. 120: Calamities - Flight

- **Conditional Sentence** in *Calamities - Flight*, see figure 120.
  - Par. 15: `Other conditions being equal,…`
    `2 Cond. => Conseq.` ;

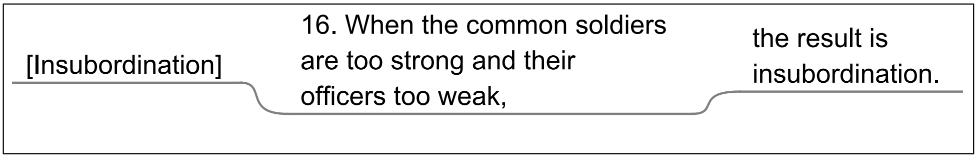

[Insubordination]
16. When the common soldiers are too strong and their officers too weak,
the result is insubordination.

Fig. 121: Calamities - Insubordination

- **Conditional Sentence** in *Calamities - Insubordination*, see figure 121.
  - Par. 16: `When the common soldiers are too strong…`
    `2 (Cond. => Conseq.)`

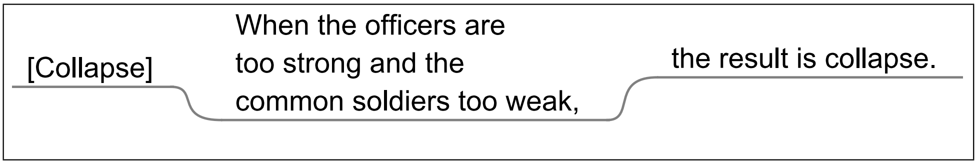

[Collapse]
When the officers are too strong and the common soldiers too weak,
the result is collapse.

Fig. 122: Calamities - Collapse

- **Conditional Sentence** in *Calamities - Collapse*, see figure 122.
  - Par. 16: `When the officers are too strong…`
    `2 (Cond. => Conseq.)`

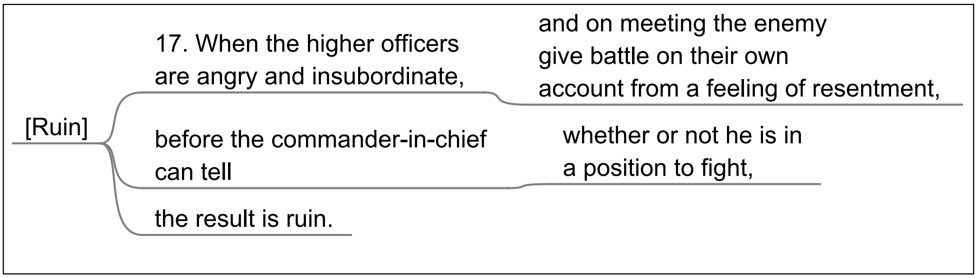

[Ruin]
17. When the higher officers are angry and insubordinate,
and on meeting the enemy give battle on their own account from a feeling of resentment,
before the commander-in-chief can tell
whether or not he is in a position to fight,
the result is ruin.

Fig. 123: Calamities - Ruin

- **Conditional Sentence** in *Calamities - Ruin*, see figure 123.
  - Par. 17: `When the higher officers are angry…`
    `(Cond, Conseq. => Conseq.)`
- **Conditional Sentence** in *Calamities - Disorganization*, see figure 124.
  - Par. 18: `When the commander is weak and without authority…`
    `4 Cond. => Conseq.`

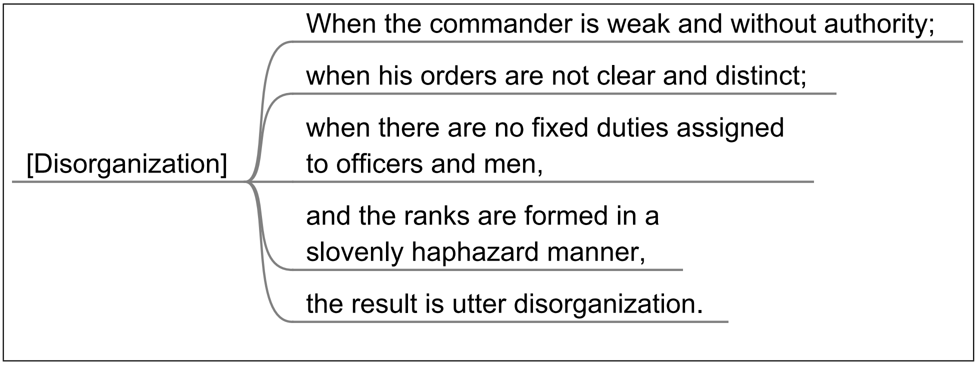

[Disorganization]
When the commander is weak and without authority;
when his orders are not clear and distinct;
when there are no fixed duties assigned to officers and men,
and the ranks are formed in a slovenly haphazard manner,
the result is utter disorganization.

Fig. 124: Calamities - Disorganization

For the calamity *disorganisation*, we see a few conditionals that would lead to the disorganisation, which could also count as an informal enumeration: a weak commander, unclear orders, no fixed duties, and haphazard ranks.

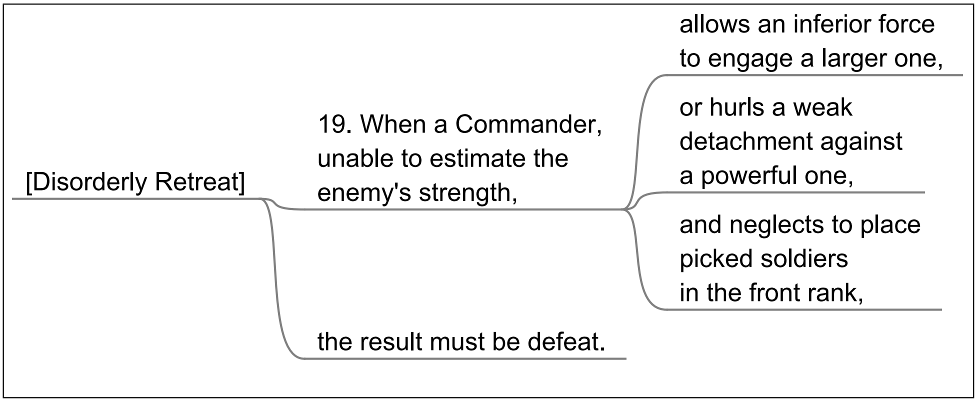

[Disorderly Retreat]
19. When a Commander, unable to estimate the enemy's strength,
allows an inferior force to engage a larger one,
or hurls a weak detachment against a powerful one,
and neglects to place picked soldiers in the front rank,
the result must be defeat.

Fig. 125: Calamities - Disorderly Retreat

- **Conditional Sentence** in *Calamities - Disorderly Retreat*, see figure 125.
  - Par. 19: `When a Commander, unable to estimate the…` `(Cond, 3 Adv. => Conseq.)`

Good Commander

- **Pairs of Opposites**
  - Par. 22: **Knowing and winning. not knowing and defeat.**
  - Par. 24: **without coveting fame or fearing disgrace.**

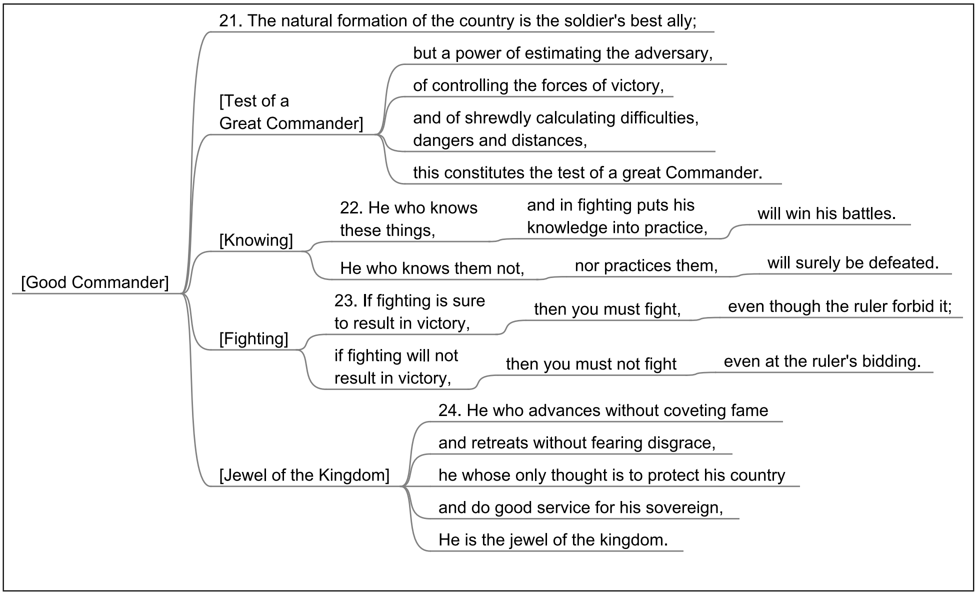

[Good Commander]
21. The natural formation of the country is the soldier's best ally;
[Test of a Great Commander]
but a power of estimating the adversary,
of controlling the forces of victory,
and of shrewdly calculating difficulties, dangers and distances,
this constitutes the test of a great Commander.
[Knowing]
22. He who knows these things,
and in fighting puts his knowledge into practice,
will win his battles.
He who knows them not,
nor practices them,
will surely be defeated.
[Fighting]
23. If fighting is sure to result in victory,
then you must fight,
even though the ruler forbid it;
if fighting will not result in victory,
then you must not fight
even at the ruler's bidding.
[Jewel of the Kingdom]
24. He who advances without coveting fame
and retreats without fearing disgrace,
he whose only thought is to protect his country
and do good service for his sovereign,
He is the jewel of the kingdom.

Fig. 126: Good Commander

- **Conditional Sentences** in *Good Commander*, see figure 126
  - Par. 22: `He who knows these things…`
    `(Cond. | Conseq. | Conseq.)` .
  - Par. 23: `If fighting is sure to result in victory…`
    `=> CompJud[ (Cond. | Adv. | - Adv.) ] (故)` (reversed indicated by 也).
  - Par. 24: `He who advances without coveting fame…`
    `=> Judge. (故)` ; 也 indicates the essence of the sentence.

Authority

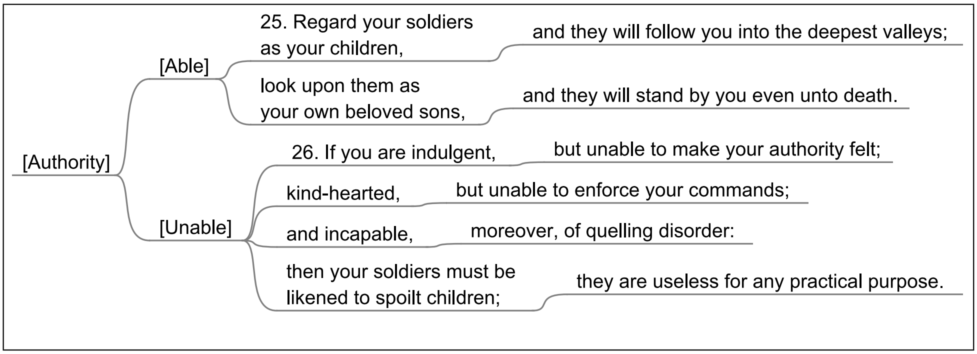

[Authority]
[Able]
25. Regard your soldiers as your children,
and they will follow you into the deepest valleys;
look upon them as your own beloved sons,
and they will stand by you even unto death.
[Unable]
26. If you are indulgent,
but unable to make your authority felt;
kind-hearted,
but unable to enforce your commands;
and incapable,
moreover, of quelling disorder:
then your soldiers must be likened to spoilt children;
they are useless for any practical purpose.

Fig. 127: Authority

- **Conditional Sentences** in *Authority*, see figure 127
  - Par. 25: `Regard your soldiers as your children…`
    `2 (Adv. => Conseq.) (故)` .
  - Par. 26: `If you are indulgent…`
    `3 Cond. => Cond. ; Judge.` 也 indicates the essence of the sentence.

Way to Victory

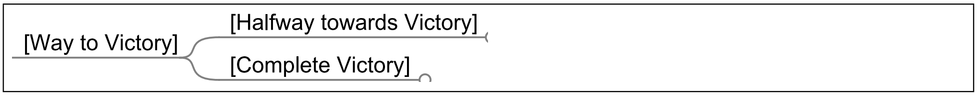

[Way to Victory]
[Halfway towards Victory]
[Complete Victory]

Fig. 128: Way to Victory

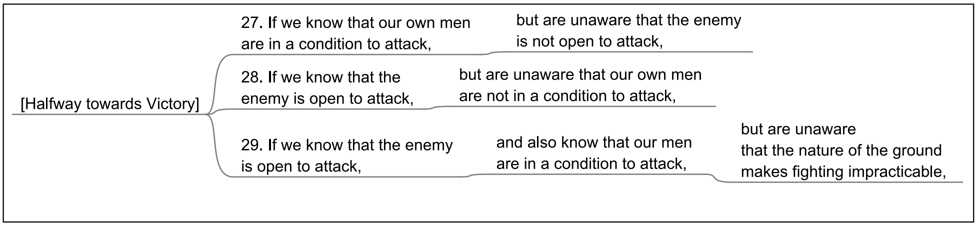

[Halfway towards Victory]
27. If we know that our own men are in a condition to attack,
but are unaware that the enemy is not open to attack,
28. If we know that the enemy is open to attack,
but are unaware that our own men are not in a condition to attack,
29. If we know that the enemy is open to attack,
and also know that our men are in a condition to attack,
but are unaware that the nature of the ground makes fighting impracticable,

Fig. 129: Half Way to Victory

- **Conditional Sentences** in *Half Way to Victory*, see figure 129
  - Par. 27: `If we know that our own men are in a condition to attack…`
    `2 Cond. => Judge.`
  - Par. 28: `If we know that the enemy is open to attack…`
    `2 Cond. => Judge.`
  - Par. 29: `If we know that the enemy is open to attack…`
    `3 Cond. => Judge.`

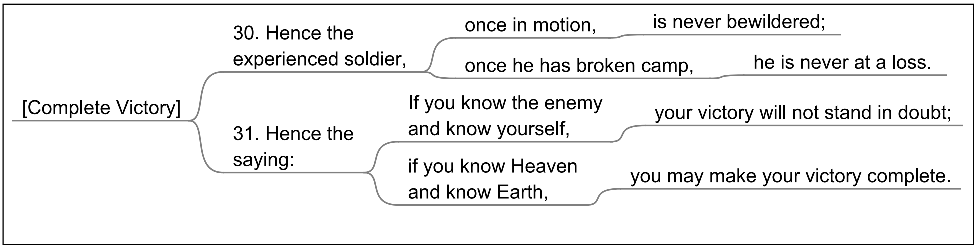

[Complete Victory]
30. Hence the experienced soldier,
once in motion,
is never bewildered;
once he has broken camp,
he is never at a loss.
31. Hence the saying:
If you know the enemy and know yourself,
your victory will not stand in doubt;
if you know Heaven and know Earth,
you may make your victory complete.

Fig. 130: Complete Victory

- **Conditional Sentences** in *Complete Victory*, see figure 130

- Par. 30: `Hence the experienced soldier…`
  ```
  => CompJud[ 2 (Conseq. => Cond) ] (故)
  ```
- Par. 31: `Hence the saying:…`
  ```
  => CompJud[ 2 (Cond. => Conseq.) ] (故)
  ```

This chapter concludes with the famous saying:

```
» Hence the saying:
   ° If you know the enemy and know yourself,
     - your victory will not stand in doubt;
   ° if you know Heaven and know Earth,
     - you may make your victory complete.
```

Structured Text

X. TERRAIN

- **1. Sun Tzu Said:**

- **Terrain**

  We may distinguish six kinds of terrain, to wit:(1) Accessible ground; (2) entangling ground; (3) deadlocked ground; (4) narrow ground; (5) precipitous ground; (6) distant ground.

  [Accessible Ground]
  - 2. Ground which can be freely traversed by both sides is called accessible.
  - 3. With regard to ground of this nature,
    - be before the enemy in occupying the raised and sunny spots,
    - and carefully guard your line of supplies.
    - Then you will be able to fight with advantage.

  [Entangling Ground]
  - 4. Ground which can be abandoned but is hard to re-occupy is called entangling.
  - 5. From a position of this sort,
    - if the enemy is unprepared,
      - you may depart and defeat him.
    - But if the enemy is prepared for your coming,
      - and you fail to defeat him,
        - then, return being impossible,
        - disaster will ensue.

  [Deadlocked Ground]
  - 6. When the position is such that neither side will gain by making the first move, it is called deadlocked ground.
  - 7. In a position of this sort,
    - even though the enemy should offer us an attractive bait,
      - it will be advisable not to stir forth,
      - but rather to retreat,
    - when half of his army has come out,
      - attack will be advantageous.

  [Narrow Ground]
  - 8. With regard to narrow ground,
    - if you can occupy them first,
      - let them be strongly garrisoned
        - to await the advent of the enemy.
    - 9. Should the army forestall you in occupying a pass,
      - do not go after him
        - if the pass is fully garrisoned,
      - but only
        - if it is weakly garrisoned.

  [Precipitous Ground]

```
  » 10. With regard to precipitous ground,
    ° if you are beforehand with your adversary,
      - you should occupy the raised and sunny spots,
      - and there wait for him to come up.
    ° 11. If the enemy has occupied them before you,
      - do not follow him,
      - but retreat
      - and try to entice him away.
[Distant Ground]
  » 12. If you are situated at a great distance from
    the enemy,
    ° and the strength of the two armies is equal,
  » it is not easy to provoke a battle,
    ° and fighting will be to your disadvantage.
13. These six are the principles connected with Earth.
  » The Commander who has attained a responsible post
    ° must be careful to study them.
```

- **Calamities**

```
14. Now an army is exposed to six several calamities,
not arising from natural causes, but from faults for
which the commander is responsible.  These are: (1)
Flight; (2) insubordination; (3) collapse; (4) ruin; (5)
disorganization; (6) disorderly retreat.
[Flight]
  » 15. Other conditions being equal,
    ° if one force is hurled against another ten times
      its size.
[Insubordination]
  » 16. When the common soldiers are too strong and
    their officers too weak.
[Collapse]
  » When the officers are too strong and the common
    soldiers too weak.
[Ruin]
  » 17. When the higher officers are angry and
    insubordinate,
    ° and on meeting the enemy give battle on their own
      account from a feeling of resentment
  » before the commander-in-chief can tell
    ° whether or not he is in a position to fight.
[Disorganization]
  » When the commander is weak and without authority;
  » when his orders are not clear and distinct;
  » when there are no fixed duties assigned to officers
    and men,
  » and the ranks are formed in a slovenly haphazard
    manner.
[Disorderly Retreat]
  » 19. When a Commander, unable to estimate the
    enemy's strength,
    ° allows an inferior force to engage a larger one,
    ° or hurls a weak detachment against a powerful
      one,
```

° and neglects to place picked soldiers in the front rank.
20. These are six ways of courting defeat,
» which must be carefully noted by the Commander who has attained a responsible post.

- **Good Commander**

21. The natural formation of the country is the soldier's best ally;
[Test of a Great Commander]
» but a power of estimating the adversary,
» of controlling the forces of victory,
» and of shrewdly calculating difficulties, dangers and distances,
» this constitutes the test of a great Commander.
[Knowing]
» 22. He who knows these things,
° and in fighting puts his knowledge into practice,
- will win his battles.
» He who knows them not,
° nor practices them,
- will surely be defeated.
[Fighting]
» 23. If fighting is sure to result in victory,
° then you must fight,
- even though the ruler forbid it;
» if fighting will not result in victory,
° then you must not fight
- even at the ruler's bidding.
[Jewel of the Kingdom]
» 24. He who advances without coveting fame
» and retreats without fearing disgrace,
» he whose only thought is to protect his country
» and do good service for his sovereign,
» He is the jewel of the kingdom.

- **Authority**

[Able]
» 25. Regard your soldiers as your children,
° and they will follow you into the deepest valleys;
» look upon them as your own beloved sons,
° and they will stand by you even unto death.
[Unable]
» 26. If you are indulgent,
° but unable to make your authority felt;
» kind-hearted,
° but unable to enforce your commands;
» and incapable,
° moreover, of quelling disorder:
» then your soldiers must be likened to spoilt children;
° they are useless for any practical purpose.

- **Way to Victory**

```
[Halfway Towards Victory]
  » 27. If we know that our own men are in a condition
    to attack,
    ° but are unaware that the enemy is not open to
      attack,
  » 28. If we know that the enemy is open to attack,
    ° but are unaware that our own men are not in a
      condition to attack,
  » 29. If we know that the enemy is open to attack,
    ° and also know that our men are in a condition to
      attack,
      - but are unaware that the nature of the ground
        makes fighting impracticable,
[Complete Victory]
  » 30. Hence the experienced soldier,
    ° once in motion,
      - is never bewildered;
    ° once he has broken camp,
      - he is never at a loss.
  » 31. Hence the saying:
    ° If you know the enemy and know yourself,
      - your victory will not stand in doubt;
    ° if you know Heaven and know Earth,
      - you may make your victory complete.
```

XI-1. THE NINE SITUATIONS - 九地

Abstract This is the first part of longest chapter in the book. It contains several miscellaneous subjects, starting with rules about how to fight in various types of terrain.

A horse jumping over the Tanxi River.

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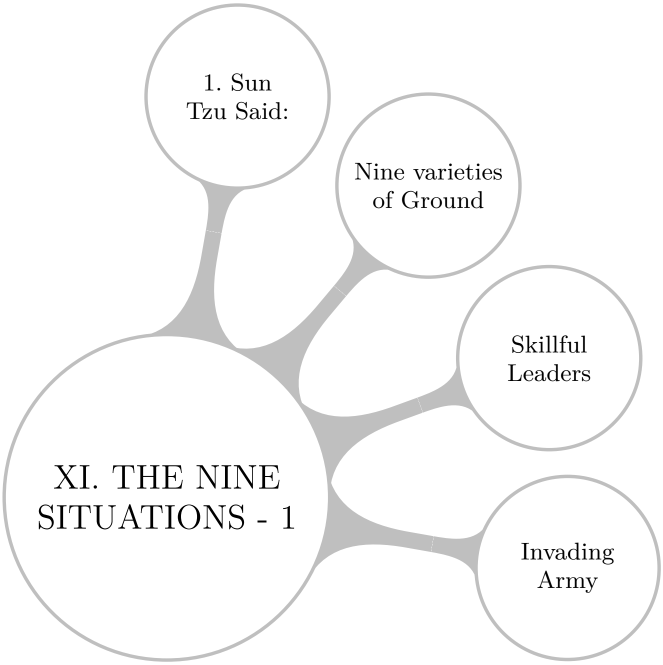
P. van Emde Boas et al., *Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps*, Logic in Asia: Studia Logica Library,
https://doi.org/10.1007/978-981-19-6250-9_21

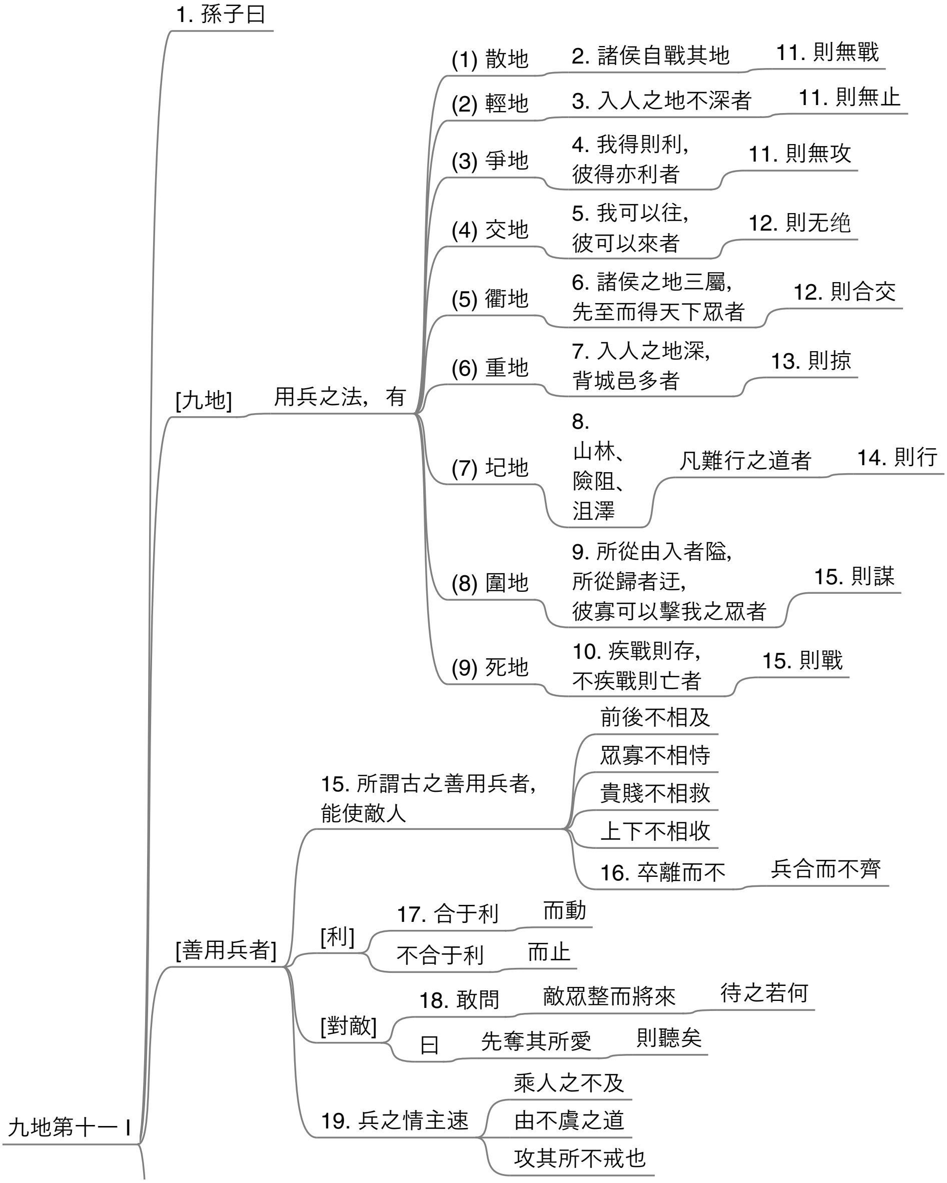
Main Concepts


1. Sun Tzu Said:
Nine varieties of Ground
Skillful Leaders
Invading Army
XI. THE NINE SITUATIONS - 1

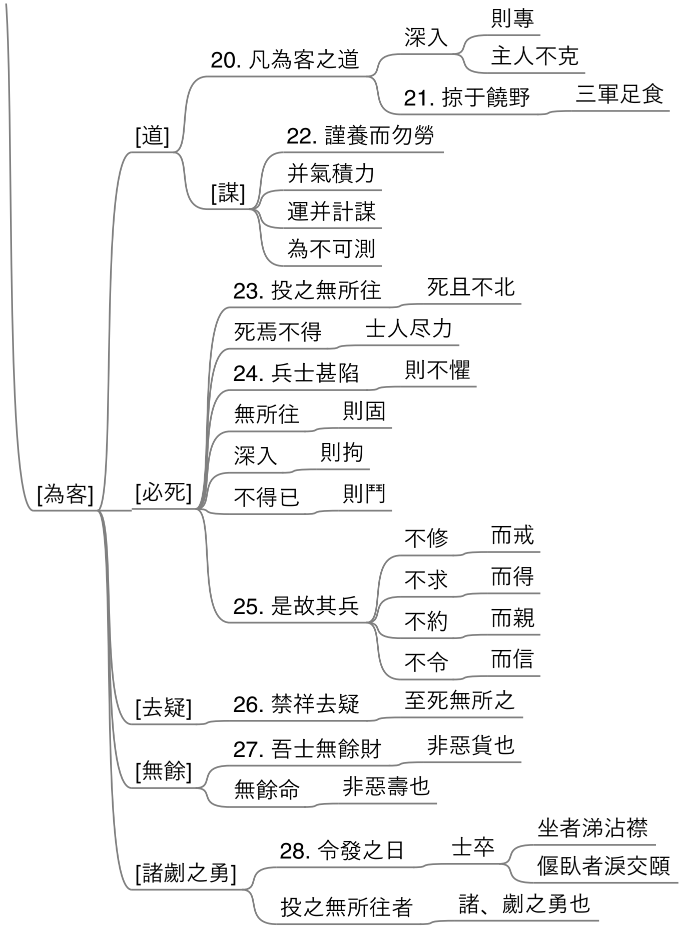
This is the first part of longest chapter in the book. It contains several miscellaneous subjects, starting with rules about how to fight in various types of terrain. The next subject is about how to care for and handle the soldiers and the army, followed again by a discussion about terrain.

Mind Maps

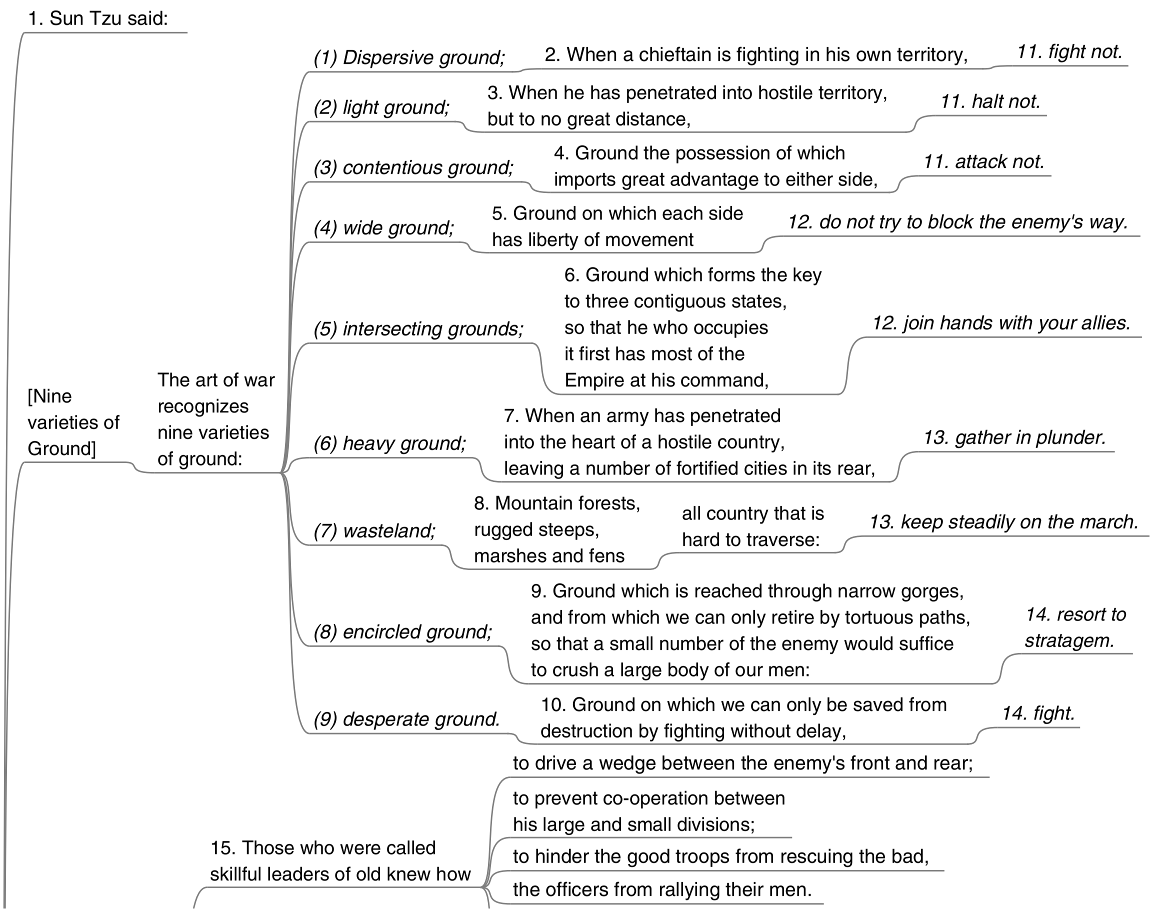
The overview for this chapter can be found in mind map figures 52 to 56.


九地第十一 I
1. 孫子曰
[九地]
用兵之法，有
(1) 散地
2. 諸侯自戰其地
11. 則無戰
(2) 輕地
3. 入人之地不深者
11. 則無止
(3) 爭地
4. 我得則利，
彼得亦利者
11. 則無攻
(4) 交地
5. 我可以往，
彼可以來者
12. 則无绝
(5) 衢地
6. 諸侯之地三屬，
先至而得天下眾者
12. 則合交
(6) 重地
7. 入人之地深，
背城邑多者
13. 則掠
(7) 圮地
8.
山林、
險阻、
沮澤
凡難行之道者
14. 則行
(8) 圍地
9. 所從由入者隘，
所從歸者迂，
彼寡可以擊我之眾者
15. 則謀
(9) 死地
10. 疾戰則存，
不疾戰則亡者
15. 則戰
[善用兵者]
15. 所謂古之善用兵者，
能使敵人
前後不相及
眾寡不相恃
貴賤不相救
上下不相收
16. 卒離而不
兵合而不齊
[利]
17. 合于利
而動
不合于利
而止
[對敵]
18. 敢問
敵眾整而將來
待之若何
曰
先奪其所愛
則聽矣
19. 兵之情主速
乘人之不及
由不虞之道
攻其所不戒也

Mind Map 52: AoW Chapter XI-1 - Chinese - Part 1

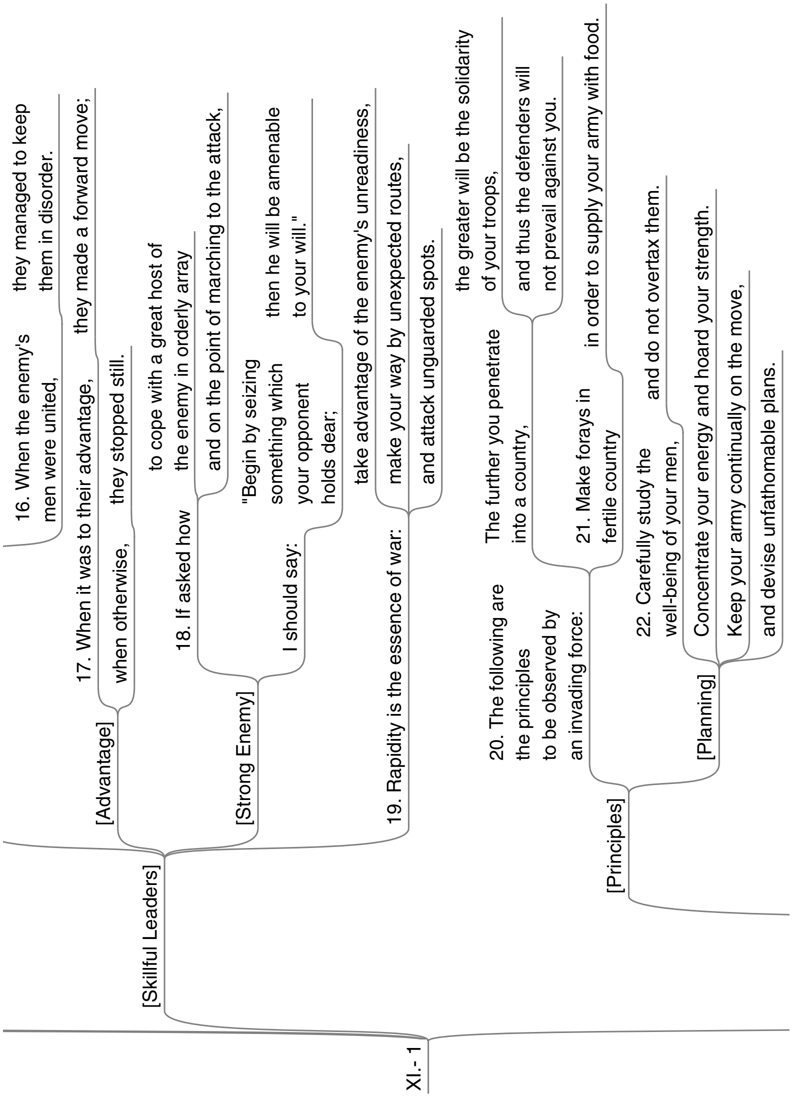

[為客]
[道]
20. 凡為客之道
深入
則專
主人不克
21. 掠于饒野
三軍足食
[謀]
22. 謹養而勿勞
并氣積力
運并計謀
為不可測
[必死]
23. 投之無所往
死且不北
死焉不得
士人尽力
24. 兵士甚陷
則不懼
無所往
則固
深入
則拘
不得已
則鬥
25. 是故其兵
不修
而戒
不求
而得
不約
而親
不令
而信
[去疑]
26. 禁祥去疑
至死無所之
[無餘]
27. 吾士無餘財
非惡貨也
無餘命
非惡壽也
[諸劌之勇]
28. 令發之日
士卒
坐者涕沾襟
偃臥者淚交頤
投之無所往者
諸、劌之勇也

Mind Map 53: AoW Chapter XI-1 - Chinese - Part 2

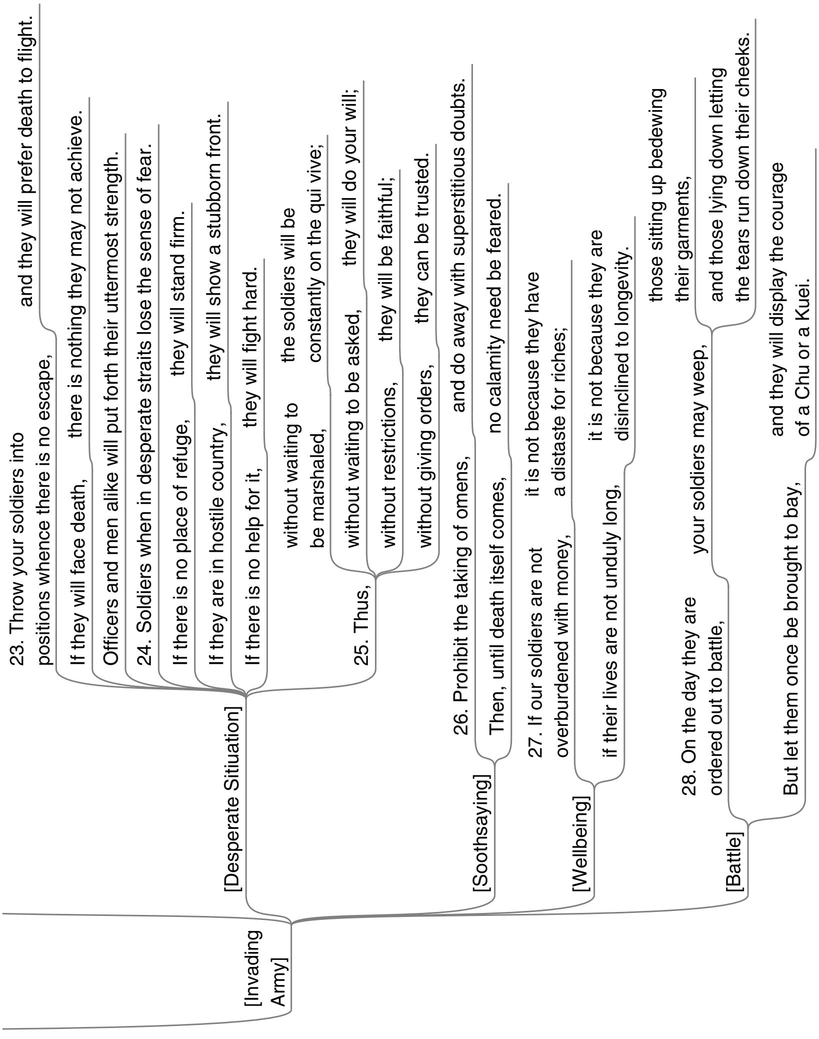


- 1. Sun Tzu said:
- [Nine varieties of Ground]
  - The art of war recognizes nine varieties of ground:
    - *(1) Dispersive ground;*
      - 2. When a chieftain is fighting in his own territory,
        - *11. fight not.*
    - *(2) light ground;*
      - 3. When he has penetrated into hostile territory, but to no great distance,
        - *11. halt not.*
    - *(3) contentious ground;*
      - 4. Ground the possession of which imports great advantage to either side,
        - *11. attack not.*
    - *(4) wide ground;*
      - 5. Ground on which each side has liberty of movement
        - *12. do not try to block the enemy's way.*
    - *(5) intersecting grounds;*
      - 6. Ground which forms the key to three contiguous states, so that he who occupies it first has most of the Empire at his command,
        - *12. join hands with your allies.*
    - *(6) heavy ground;*
      - 7. When an army has penetrated into the heart of a hostile country, leaving a number of fortified cities in its rear,
        - *13. gather in plunder.*
    - *(7) wasteland;*
      - 8. Mountain forests, rugged steeps, marshes and fens
        - all country that is hard to traverse:
          - *13. keep steadily on the march.*
    - *(8) encircled ground;*
      - 9. Ground which is reached through narrow gorges, and from which we can only retire by tortuous paths, so that a small number of the enemy would suffice to crush a large body of our men:
        - *14. resort to stratagem.*
    - *(9) desperate ground.*
      - 10. Ground on which we can only be saved from destruction by fighting without delay,
        - *14. fight.*
- 15. Those who were called skillful leaders of old knew how
  - to drive a wedge between the enemy's front and rear;
  - to prevent co-operation between his large and small divisions;
  - to hinder the good troops from rescuing the bad,
  - the officers from rallying their men.

Mind Map 54: AoW Chapter XI-1 - THE NINE SITUATIONS - Part 1


XI.- 1
[Skillful Leaders]
16. When the enemy's men were united,
they managed to keep them in disorder.
[Advantage]
17. When it was to their advantage,
they made a forward move;
when otherwise,
they stopped still.
[Strong Enemy]
18. If asked how
to cope with a great host of the enemy in orderly array
and on the point of marching to the attack,
I should say:
"Begin by seizing something which your opponent holds dear;
then he will be amenable to your will."
19. Rapidity is the essence of war:
take advantage of the enemy's unreadiness,
make your way by unexpected routes,
and attack unguarded spots.
[Principles]
20. The following are the principles to be observed by an invading force:
The further you penetrate into a country,
the greater will be the solidarity of your troops,
and thus the defenders will not prevail against you.
21. Make forays in fertile country
in order to supply your army with food.
[Planning]
22. Carefully study the well-being of your men,
and do not overtax them.
Concentrate your energy and hoard your strength.
Keep your army continually on the move,
and devise unfathomable plans.

Mind Map 55: AoW Chapter XI-1 - THE NINE SITUATIONS - Part 2


[Invading Army]
[Desperate Sitiuation]
23. Throw your soldiers into positions whence there is no escape,
and they will prefer death to flight.
If they will face death,
there is nothing they may not achieve.
Officers and men alike will put forth their uttermost strength.
24. Soldiers when in desperate straits lose the sense of fear.
If there is no place of refuge,
they will stand firm.
If they are in hostile country,
they will show a stubborn front.
If there is no help for it,
they will fight hard.
25. Thus,
without waiting to be marshaled,
the soldiers will be constantly on the qui vive;
without waiting to be asked,
they will do your will;
without restrictions,
they will be faithful;
without giving orders,
they can be trusted.
[Soothsaying]
26. Prohibit the taking of omens,
and do away with superstitious doubts.
Then, until death itself comes,
no calamity need be feared.
[Wellbeing]
27. If our soldiers are not overburdened with money,
it is not because they have a distaste for riches;
if their lives are not unduly long,
it is not because they are disinclined to longevity.
[Battle]
28. On the day they are ordered out to battle,
your soldiers may weep,
those sitting up bedewing their garments,
and those lying down letting the tears run down their cheeks.
But let them once be brought to bay,
and they will display the courage of a Chu or a Kuei.

Mind Map 56: AoW Chapter XI-1 - THE NINE SITUATIONS - Part 3

Details and Patterns

Sun Tzu Said:

The original translation of Giles [23] says at the start of this chapter:

> 1. Sun Tzu Said: The art of war recognizes nine varieties of ground: (1) Dispersive ground; (2) facile ground; (3) contentious ground; (4) open ground; (5) ground of intersecting highways; (6) serious ground; (7) difficult ground; (8) hemmed-in ground; (9) desperate ground.

We integrated this enumeration into the mind map.

This is the fourth chapter of the AoW in which Sun Tzu describes terrain. Here, an enumeration of terrain types occurs three times, you will see the other two in the second part of this chapter. See: Terrain, on page 397, for a description of the use of terrain in various chapters of the AoW.

Nine Varieties of Ground

These terrain types appear in the form of an *enumeration* of 9 varieties of ground, such as dispersive ground, light ground, etc.

When you compare the text in the original translation with the structure in the mind map of paragraphs 2-14, you will notice that a reordering took place. We immediately let the definition follow the name of the terrain type, instead of repeating them.

- **Definitions**
  - Par. 2-10: … `9 Def.`

- **Conditional Sentence** in *Nine Varieties of Ground*, see figure 131
  - Par. 11-14: `On dispersive ground…`
    `=> 9 (Cond. => Adv.) (故)` .

Skillful Leaders

- **Pairs of Opposites**
  - Par. 15: Skillful leaders knowledge
    - **Front and Rear**;
    - **Large and Small** divisions;
    - **Good and Bad**;
    - **Officers and Men**.
  - Par. 17: **Forward Move or Stopped Still**.

- **Conditional Sentences** in *Skillful Leaders*, see figure 132
  - Par. 16: `When the enemy 's men were united…`
    `Cond. => Conseq.` ;

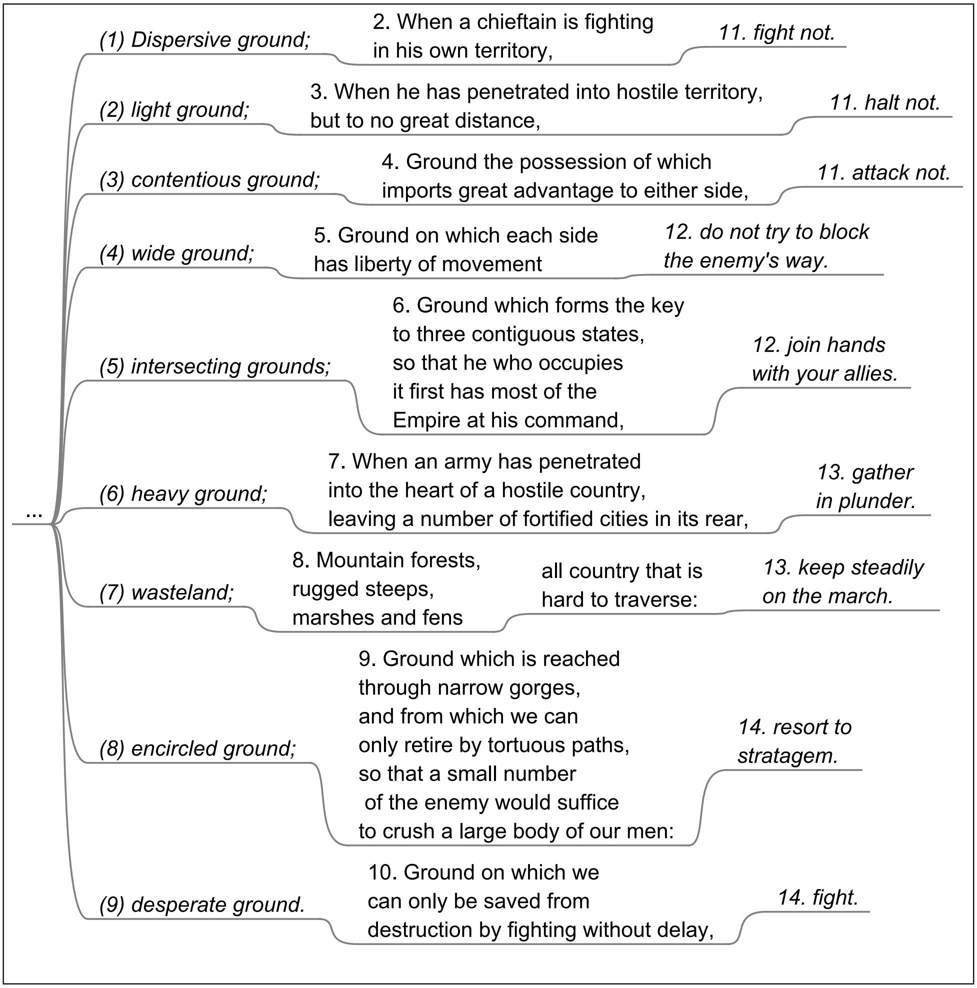

...
(1) Dispersive ground;
2. When a chieftain is fighting in his own territory,
11. fight not.
(2) light ground;
3. When he has penetrated into hostile territory, but to no great distance,
11. halt not.
(3) contentious ground;
4. Ground the possession of which imports great advantage to either side,
11. attack not.
(4) wide ground;
5. Ground on which each side has liberty of movement
12. do not try to block the enemy's way.
(5) intersecting grounds;
6. Ground which forms the key to three contiguous states, so that he who occupies it first has most of the Empire at his command,
12. join hands with your allies.
(6) heavy ground;
7. When an army has penetrated into the heart of a hostile country, leaving a number of fortified cities in its rear,
13. gather in plunder.
(7) wasteland;
8. Mountain forests, rugged steeps, marshes and fens
all country that is hard to traverse:
13. keep steadily on the march.
(8) encircled ground;
9. Ground which is reached through narrow gorges, and from which we can only retire by tortuous paths, so that a small number of the enemy would suffice to crush a large body of our men:
14. resort to stratagem.
(9) desperate ground.
10. Ground on which we can only be saved from destruction by fighting without delay,
14. fight.

Fig. 131: Nine Varieties of Ground

- Par. 17: `When it was to their advantage…`
  `2 (Cond. => Adv.)` , if-then-else construction
- Par. 18: `If asked how…`
  `Cond. => Adv.`

Invading Army

- **Conditional Sentence** in *Principles*, see figure 134
  - Par. 20: `The following are the principles to be observed…`
    `Cond. => Conseq.` ; Universal quantification 凡
- **Conditional Sentences** in *Desperate Situation*, see figure 135

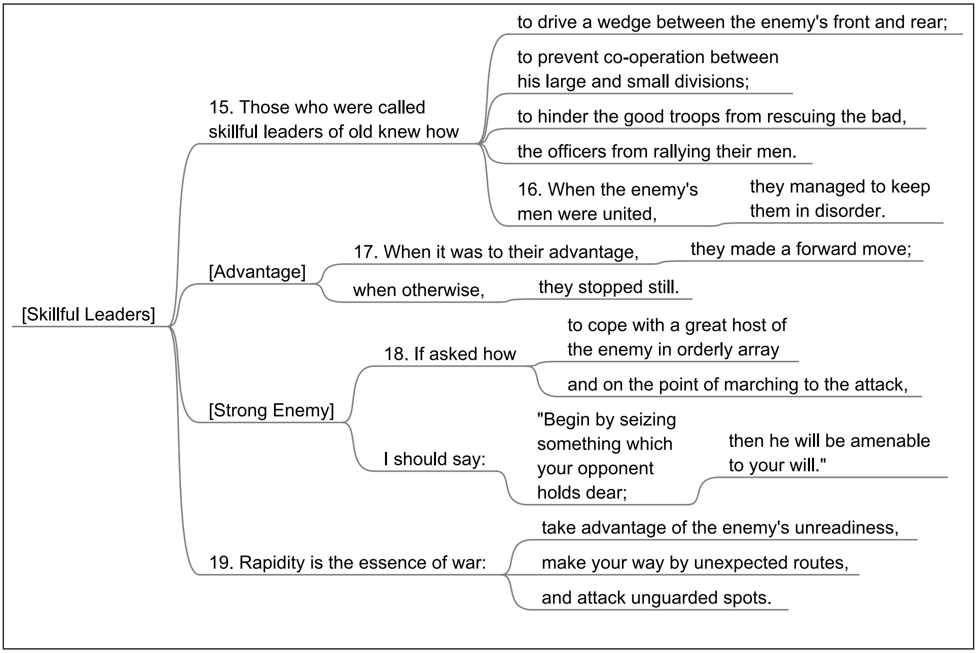

[Skillful Leaders]
15. Those who were called skillful leaders of old knew how
to drive a wedge between the enemy's front and rear;
to prevent co-operation between his large and small divisions;
to hinder the good troops from rescuing the bad,
the officers from rallying their men.
16. When the enemy's men were united,
they managed to keep them in disorder.
[Advantage]
17. When it was to their advantage,
they made a forward move;
when otherwise,
they stopped still.
[Strong Enemy]
18. If asked how
to cope with a great host of the enemy in orderly array
and on the point of marching to the attack,
I should say:
"Begin by seizing something which your opponent holds dear;
then he will be amenable to your will."
19. Rapidity is the essence of war:
take advantage of the enemy's unreadiness,
make your way by unexpected routes,
and attack unguarded spots.

Fig. 132: Skillful Leaders

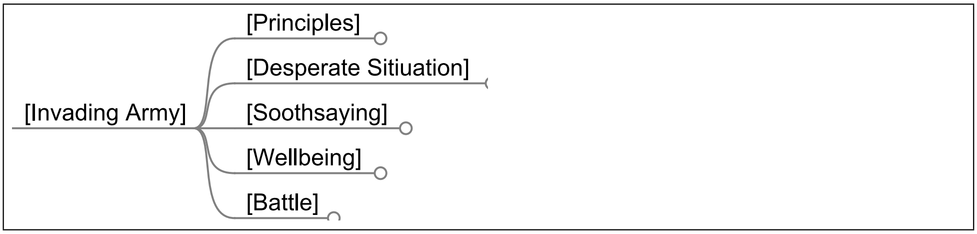

[Invading Army]
[Principles]
[Desperate Sitiuation]
[Soothsaying]
[Wellbeing]
[Battle]

Fig. 133: Invading Army - Overview

  - Par. 23: `Throw your soldiers into positions whence…`
    `2 (Cond. => Conseq.)`
  - Par. 24: `Soldiers when in desperate straits…`
    `4 (Cond. => Conseq.)`
  - Par. 25: `Thus, without waiting to be marshaled,…`
    `=> 4(Cond. => Conseq. (故)`

- **Conditional Sentences** in *Soothsayiing*, see figure 136
  - Par. 26: `Prohibit the taking of omens…`
    `2 Adv. => Conseq.`

- **Conditional Sentence** in *Wellbeing*, see figure 137
  - Par. 27: `If our soldiers are not overburdened with money,…`
    `2 (Cond. => Cond)` ; (reversed indicated by 也)

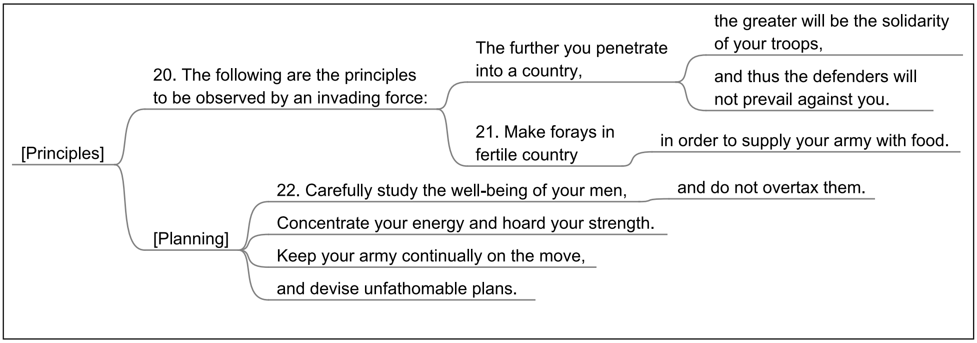

[Principles]
20. The following are the principles to be observed by an invading force:
The further you penetrate into a country,
the greater will be the solidarity of your troops,
and thus the defenders will not prevail against you.
21. Make forays in fertile country
in order to supply your army with food.
[Planning]
22. Carefully study the well-being of your men,
and do not overtax them.
Concentrate your energy and hoard your strength.
Keep your army continually on the move,
and devise unfathomable plans.

Fig. 134: Principles

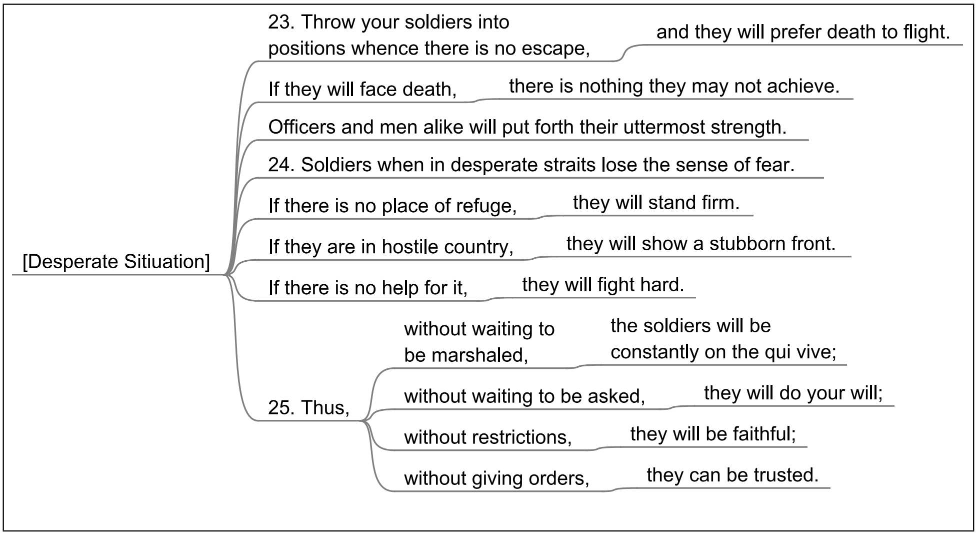

[Desperate Sitiuation]
23. Throw your soldiers into positions whence there is no escape,
and they will prefer death to flight.
If they will face death,
there is nothing they may not achieve.
Officers and men alike will put forth their uttermost strength.
24. Soldiers when in desperate straits lose the sense of fear.
If there is no place of refuge,
they will stand firm.
If they are in hostile country,
they will show a stubborn front.
If there is no help for it,
they will fight hard.
25. Thus,
without waiting to be marshaled,
the soldiers will be constantly on the qui vive;
without waiting to be asked,
they will do your will;
without restrictions,
they will be faithful;
without giving orders,
they can be trusted.

Fig. 135: Desperate Situation

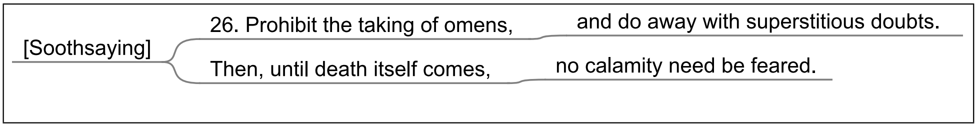

[Soothsaying]
26. Prohibit the taking of omens,
and do away with superstitious doubts.
Then, until death itself comes,
no calamity need be feared.

Fig. 136: Soothsayiing

- **Conditional Sentence** in *Battle*, see figure 138
  - Par. 28: `On the day they are ordered out to battle…`
    `Cond. => Conseq. ;`

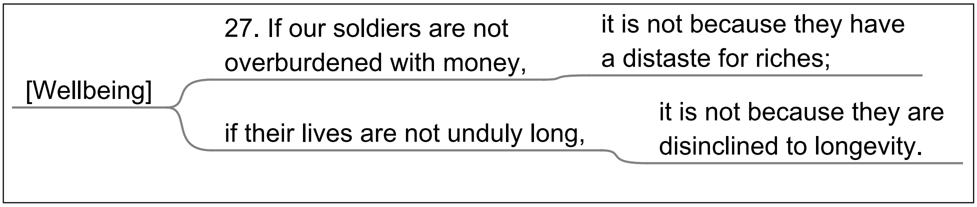

[Wellbeing]
27. If our soldiers are not overburdened with money,
it is not because they have a distaste for riches;
if their lives are not unduly long,
it is not because they are disinclined to longevity.

Fig. 137: Wellbeing

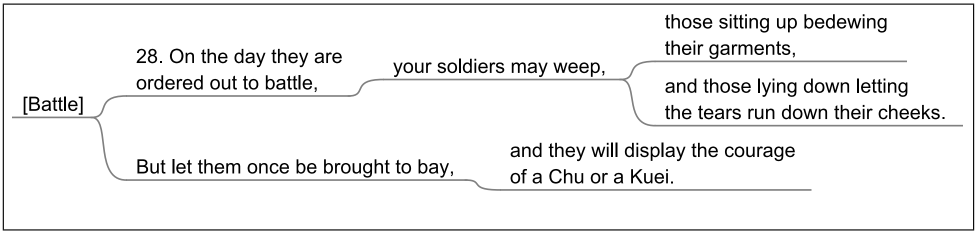

[Battle]
28. On the day they are ordered out to battle,
your soldiers may weep,
those sitting up bedewing their garments,
and those lying down letting the tears run down their cheeks.
But let them once be brought to bay,
and they will display the courage of a Chu or a Kuei.

Fig. 138: Battle

Structured Text

XI. THE NINE SITUATIONS - 1

- **1. Sun Tzu Said:**

- **Nine varieties of Ground**

  The art of war recognizes nine varieties of ground:
  - (1) Dispersive ground;
    - 2. When a chieftain is fighting in his own territory,
      - 11. fight not.
  - (2) light ground;
    - 3. When he has penetrated into hostile territory, but to no great distance,
      - 11. halt not.
  - (3) contentious ground;
    - 4. Ground the possession of which imports great advantage to either side,
      - 11. attack not.
  - (4) wide ground;
    - 5. Ground on which each side has liberty of movement
      - 12. do not try to block the enemy's way.
  - (5) intersecting grounds;
    - 6. Ground which forms the key to three contiguous states,so that he who occupies it first has most of the Empire at his command,
      - 12. join hands with your allies.
  - (6) heavy ground;
    - 7. When an army has penetrated into the heart of a hostile country, leaving a number of fortified cities in its rear,
      - 13. gather in plunder.
  - (7) wasteland;
    - 8. Mountain forests, rugged steeps, marshes and fens
      - --all country that is hard to traverse:
        - 13. keep steadily on the march.
  - (8) encircled ground;
    - 9. Ground which is reached through narrow gorges, and from which we can only retire by tortuous paths, so that a small number of the enemy would suffice to crush a large body of our men:
      - 14. resort to stratagem.
  - (9) desperate ground.
    - 10. Ground on which we can only be saved from destruction by fighting without delay,
      - 14. fight.

- **Skillful Leaders**

```
15. Those who were called skillful leaders of old knew
how
  » to drive a wedge between the enemy 's front and
    rear;
  » to prevent co-operation between his large and small
    divisions;
  » to hinder the good troops from rescuing the bad,
  » the officers from rallying their men.
  » 16. When the enemy 's men were united,
    ° they managed to keep them in disorder.
[Advantage]
  » 17. When it was to their advantage,
    ° they made a forward move;
  » when otherwise,
    ° they stopped still.
[Strong Enemy]
  » 18. If asked how
    ° to cope with a great host of the enemy in orderly
      array
    ° and on the point of marching to the attack,
  » I should say:
    ° Begin by seizing something which your opponent
      holds dear;
      - then he will be amenable to your will.
19. Rapidity is the essence of war:
  » take advantage of the enemy 's unreadiness,
  » make your way by unexpected routes,
  » and attack unguarded spots.
```

- **Invading Army**

```
[Principles]
  » 20. The following are the principles to be observed
    by an invading force:
    ° The further you penetrate into a country,
      - the greater will be the solidarity of your
        troops,
      - and thus the defenders will not prevail against
        you.
    ° 21. Make forays in fertile country
      - in order to supply your army with food.
  » [Planning]
    ° 22. Carefully study the well-being of your men,
      - and do not overtax them.
    ° Concentrate your energy and hoard your strength.
    ° Keep your army continually on the move,
    ° and devise unfathomable plans.
[Desperate Sitiuation]
  » 23. Throw your soldiers into positions whence there
    is no escape,
    ° and they will prefer death to flight.
  » If they will face death,
    ° there is nothing they may not achieve.
  » Officers and men alike will put forth their
    uttermost strength.
```

» 24. Soldiers when in desperate straits lose the sense of fear.
» If there is no place of refuge,
  ° they will stand firm.
» If they are in hostile country,
  ° they will show a stubborn front.
» If there is no help for it,
  ° they will fight hard.
» 25. Thus,
  ° without waiting to be marshaled,
    - the soldiers will be constantly on the qui vive;
  ° without waiting to be asked,
    - they will do your will;
  ° without restrictions,
    - they will be faithful;
  ° without giving orders,
    - they can be trusted.

[Soothsaying]
» 26. Prohibit the taking of omens,
  ° and do away with superstitious doubts.
» Then, until death itself comes,
  ° no calamity need be feared.

[Wellbeing]
» 27. If our soldiers are not overburdened with money,
  ° it is not because they have a distaste for riches;
» if their lives are not unduly long,
  ° it is not because they are disinclined to longevity.

[Battle]
» 28. On the day they are ordered out to battle,
  ° your soldiers may weep,
    - those sitting up bedewing their garments,
    - and those lying down letting the tears run down their cheeks.
» But let them once be brought to bay,
  ° and they will display the courage of a Chu or a Kuei.

XI-2. THE NINE SITUATIONS - 九地

Abstract This is the second part of the longest chapter in the book.

Guan Yu killing Bian Xi at the Sishui pass.

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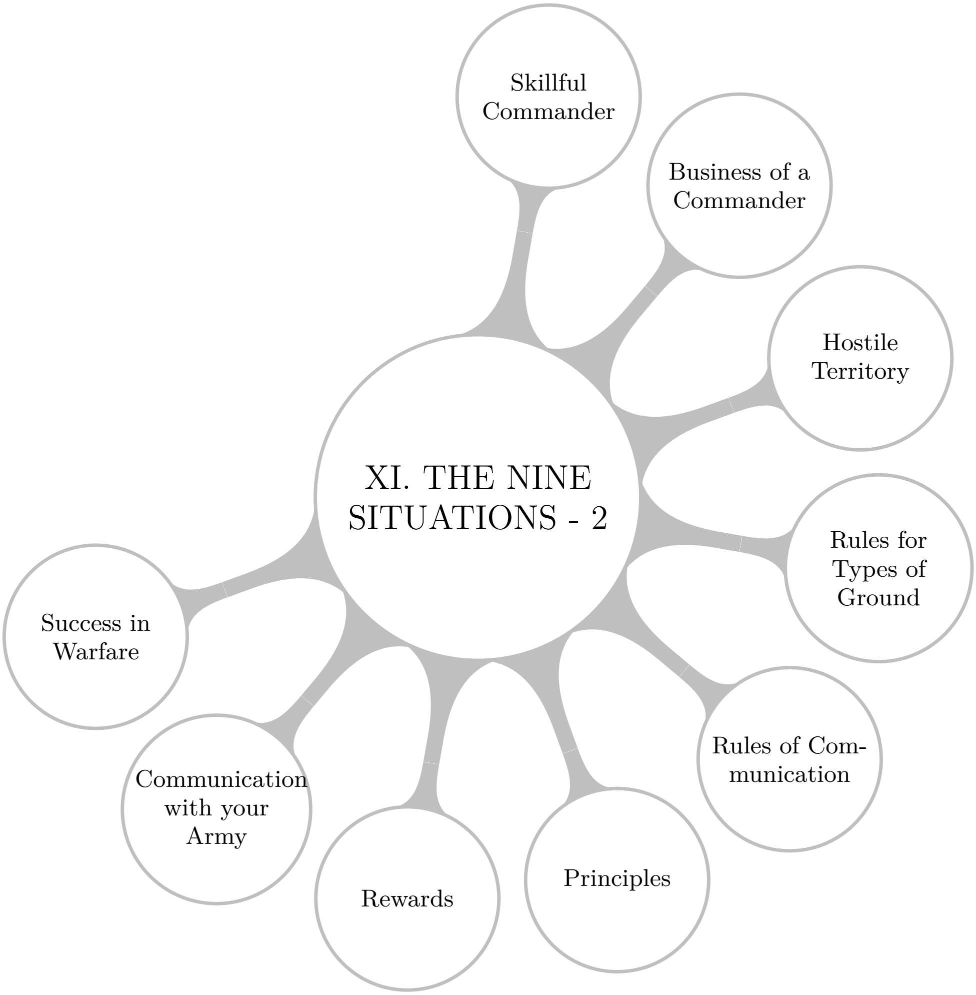
P. van Emde Boas et al., *Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps*, Logic in Asia: Studia Logica Library,
https://doi.org/10.1007/978-981-19-6250-9_22

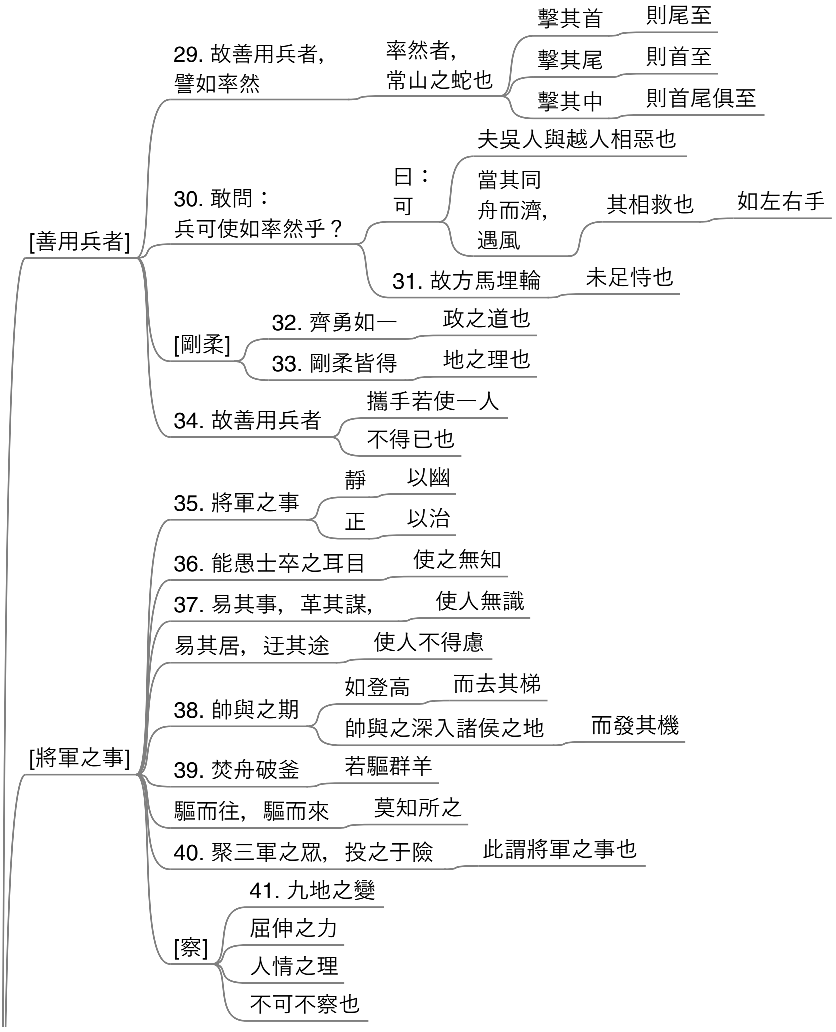
Main Concepts


XI. THE NINE SITUATIONS - 2
Skillful Commander
Business of a Commander
Hostile Territory
Rules for Types of Ground
Rules of Communication
Principles
Rewards
Communication with your Army
Success in Warfare

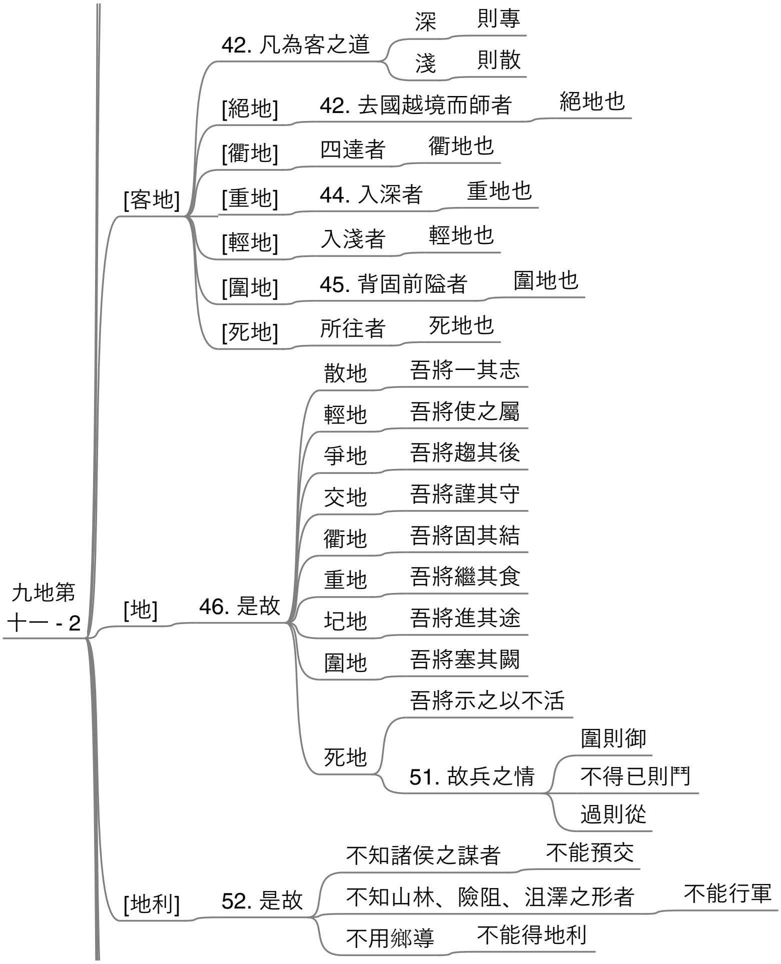
This is the second part of the longest chapter in the book.

Mind Maps

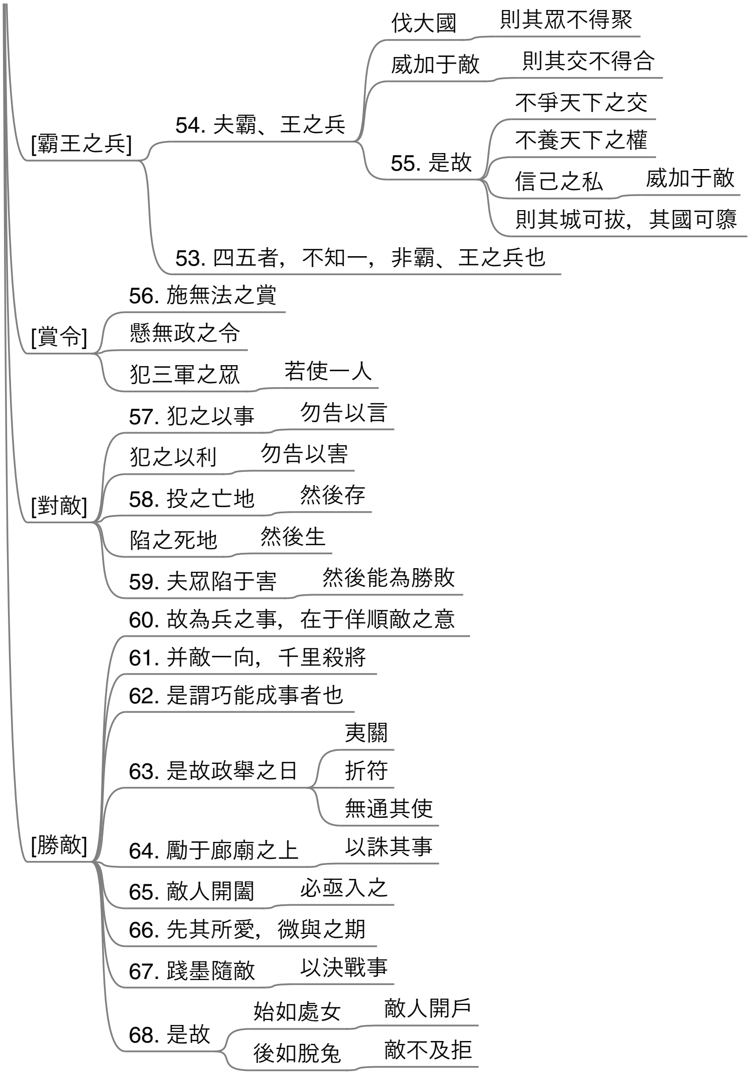
The overview for this chapter can be found in mind map figures 57 to 63.


[善用兵者]
29. 故善用兵者，譬如率然
率然者，常山之蛇也
擊其首
則尾至
擊其尾
則首至
擊其中
則首尾俱至
30. 敢問：兵可使如率然乎？
曰：可
夫吳人與越人相惡也
當其同舟而濟，遇風
其相救也
如左右手
31. 故方馬埋輪
未足恃也
[剛柔]
32. 齊勇如一
政之道也
33. 剛柔皆得
地之理也
34. 故善用兵者
攜手若使一人
不得已也
[將軍之事]
35. 將軍之事
靜
以幽
正
以治
36. 能愚士卒之耳目
使之無知
37. 易其事，革其謀，
使人無識
易其居，迂其途
使人不得慮
38. 帥與之期
如登高
而去其梯
帥與之深入諸侯之地
而發其機
39. 焚舟破釜
若驅群羊
驅而往，驅而來
莫知所之
40. 聚三軍之眾，投之于險
此謂將軍之事也
[察]
41. 九地之變
屈伸之力
人情之理
不可不察也

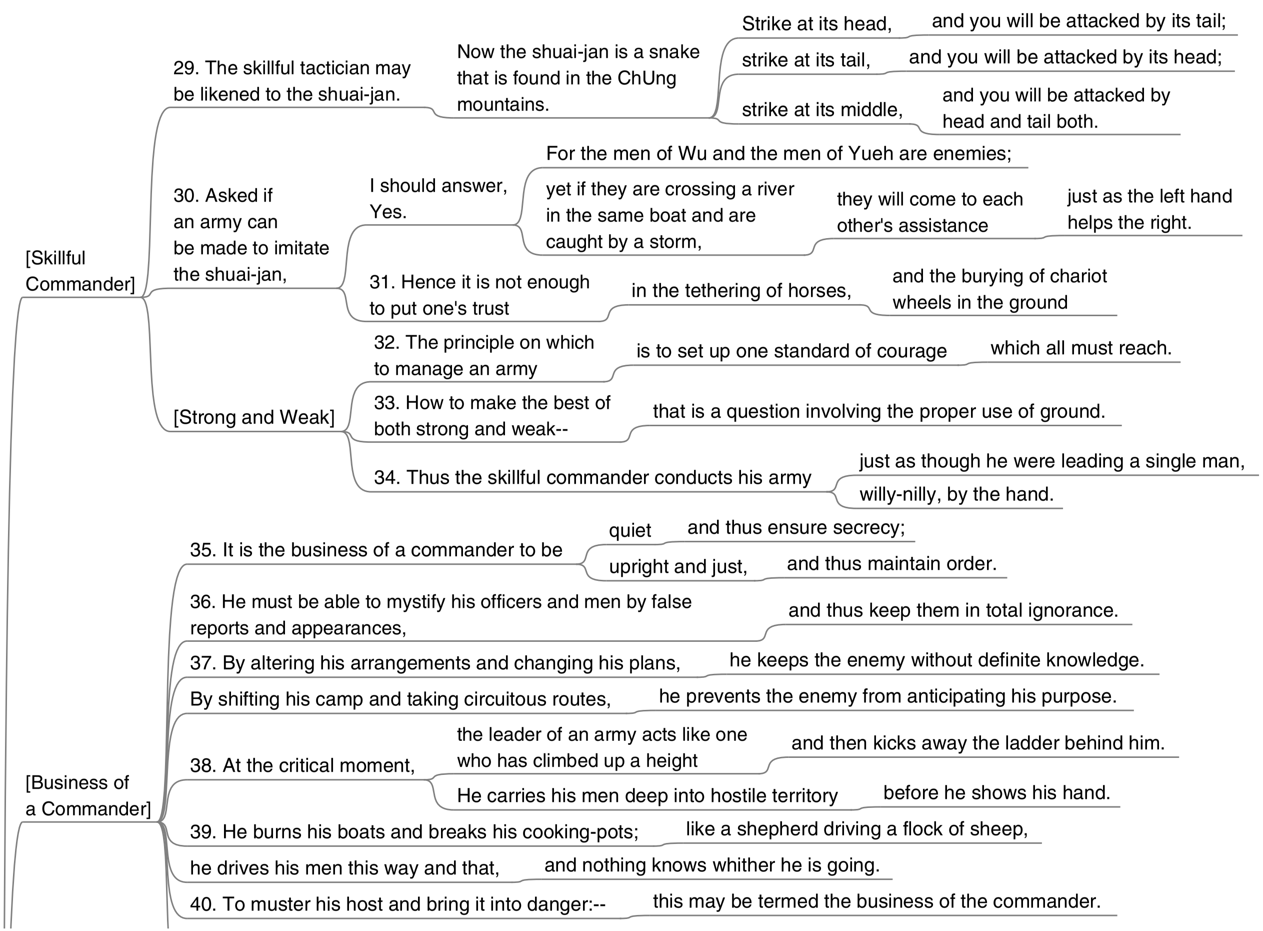
Mind Map 57: AoW Chapter XI-2 - Part 1


九地第
十一 - 2
[客地]
42. 凡為客之道
深
則專
淺
則散
[絕地]
42. 去國越境而師者
絕地也
[衢地]
四達者
衢地也
[重地]
44. 入深者
重地也
[輕地]
入淺者
輕地也
[圍地]
45. 背固前隘者
圍地也
[死地]
所往者
死地也
[地]
46. 是故
散地
吾將一其志
輕地
吾將使之屬
爭地
吾將趨其後
交地
吾將謹其守
衢地
吾將固其結
重地
吾將繼其食
圮地
吾將進其途
圍地
吾將塞其闕
死地
吾將示之以不活
51. 故兵之情
圍則御
不得已則鬥
過則從
[地利]
52. 是故
不知諸侯之謀者
不能預交
不知山林、險阻、沮澤之形者
不能行軍
不用鄉導
不能得地利

Mind Map 58: AoW Chapter XI-2 - Part 2

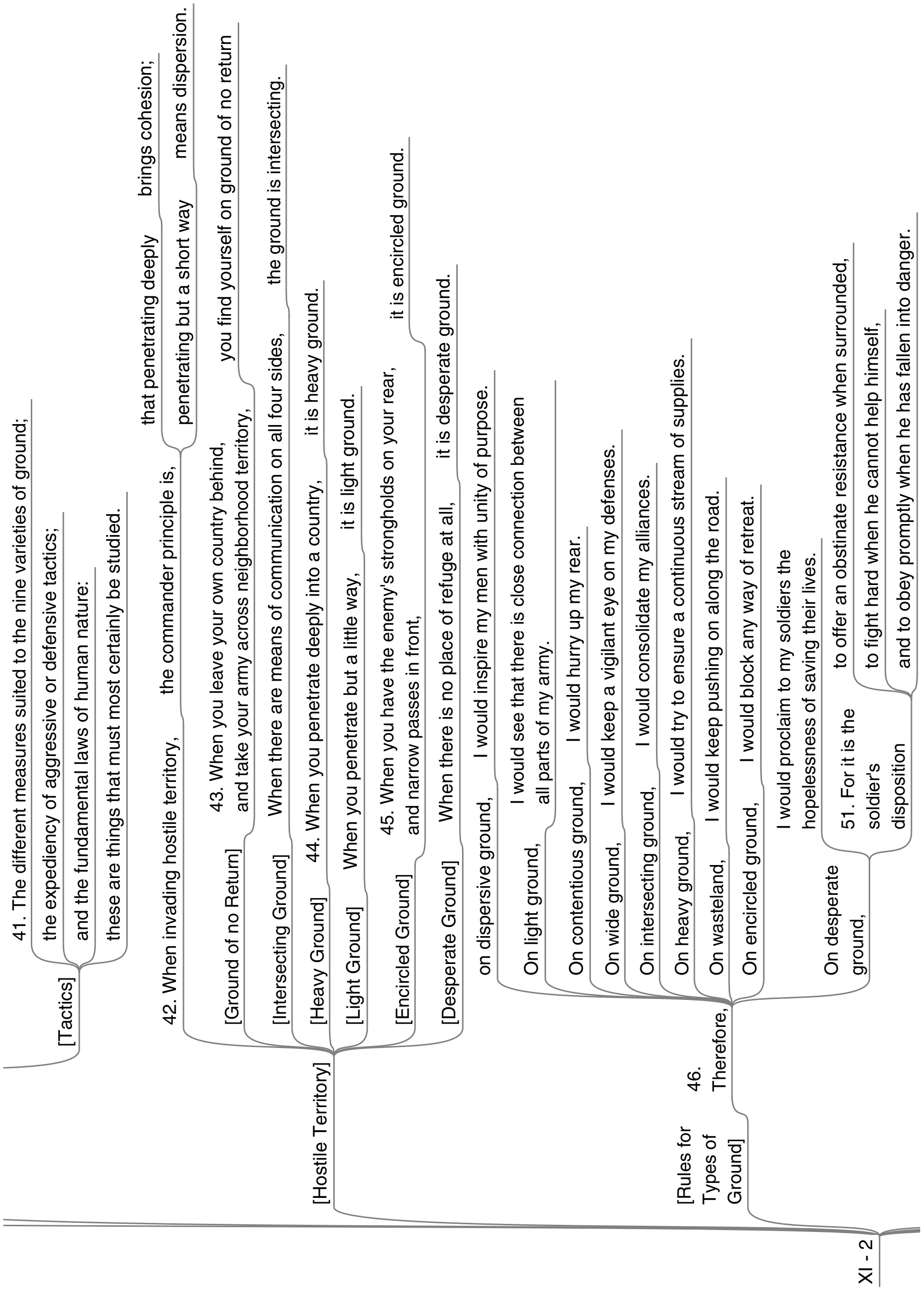

[霸王之兵]
54. 夫霸、王之兵
伐大國
則其眾不得聚
威加于敵
則其交不得合
55. 是故
不爭天下之交
不養天下之權
信己之私
威加于敵
則其城可拔，其國可隳
53. 四五者，不知一，非霸、王之兵也
[賞令]
56. 施無法之賞
懸無政之令
犯三軍之眾
若使一人
[對敵]
57. 犯之以事
勿告以言
犯之以利
勿告以害
58. 投之亡地
然後存
陷之死地
然後生
59. 夫眾陷于害
然後能為勝敗
[勝敵]
60. 故為兵之事，在于佯順敵之意
61. 并敵一向，千里殺將
62. 是謂巧能成事者也
63. 是故政舉之日
夷關
折符
無通其使
64. 勵于廊廟之上
以誅其事
65. 敵人開闔
必亟入之
66. 先其所愛，微與之期
67. 踐墨隨敵
以決戰事
68. 是故
始如處女
敵人開戶
後如脫兔
敵不及拒

Mind Map 59: AoW Chapter XI-2 - Part 3



- [Skillful Commander]
  - 29. The skillful tactician may be likened to the shuai-jan.
    - Now the shuai-jan is a snake that is found in the ChUng mountains.
      - Strike at its head,
        - and you will be attacked by its tail;
      - strike at its tail,
        - and you will be attacked by its head;
      - strike at its middle,
        - and you will be attacked by head and tail both.
  - 30. Asked if an army can be made to imitate the shuai-jan,
    - I should answer, Yes.
      - For the men of Wu and the men of Yueh are enemies;
      - yet if they are crossing a river in the same boat and are caught by a storm,
        - they will come to each other's assistance
          - just as the left hand helps the right.
    - 31. Hence it is not enough to put one's trust
      - in the tethering of horses,
        - and the burying of chariot wheels in the ground
  - [Strong and Weak]
    - 32. The principle on which to manage an army
      - is to set up one standard of courage
        - which all must reach.
    - 33. How to make the best of both strong and weak--
      - that is a question involving the proper use of ground.
    - 34. Thus the skillful commander conducts his army
      - just as though he were leading a single man,
      - willy-nilly, by the hand.
- [Business of a Commander]
  - 35. It is the business of a commander to be
    - quiet
      - and thus ensure secrecy;
    - upright and just,
      - and thus maintain order.
  - 36. He must be able to mystify his officers and men by false reports and appearances,
    - and thus keep them in total ignorance.
  - 37. By altering his arrangements and changing his plans,
    - he keeps the enemy without definite knowledge.
  - By shifting his camp and taking circuitous routes,
    - he prevents the enemy from anticipating his purpose.
  - 38. At the critical moment,
    - the leader of an army acts like one who has climbed up a height
      - and then kicks away the ladder behind him.
    - He carries his men deep into hostile territory
      - before he shows his hand.
  - 39. He burns his boats and breaks his cooking-pots;
    - like a shepherd driving a flock of sheep,
  - he drives his men this way and that,
    - and nothing knows whither he is going.
  - 40. To muster his host and bring it into danger:--
    - this may be termed the business of the commander.

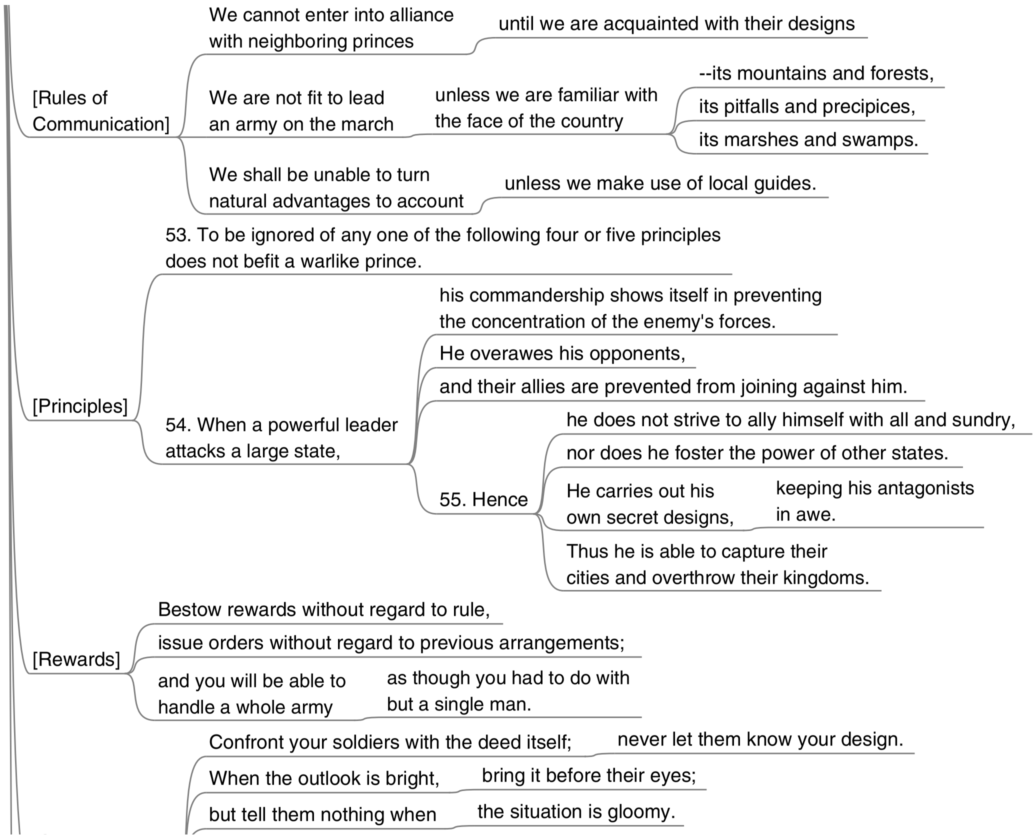
Mind Map 60: AoW Chapter XI-2 - THE NINE SITUATIONS - Part 1



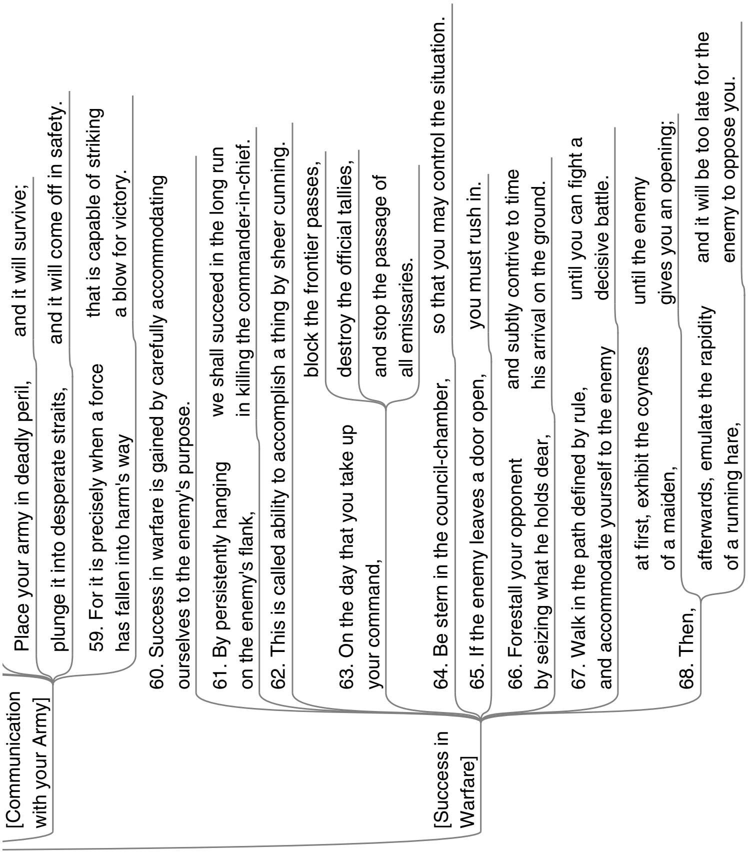
XI - 2

- [Tactics]
  - 41. The different measures suited to the nine varieties of ground;
  - the expediency of aggressive or defensive tactics;
  - and the fundamental laws of human nature:
  - these are things that must most certainly be studied.
- [Hostile Territory]
  - 42. When invading hostile territory,
    - the commander principle is,
      - that penetrating deeply
        - brings cohesion;
      - penetrating but a short way
        - means dispersion.
  - [Ground of no Return]
    - 43. When you leave your own country behind, and take your army across neighborhood territory,
      - you find yourself on ground of no return
  - [Intersecting Ground]
    - When there are means of communication on all four sides,
      - the ground is intersecting.
  - [Heavy Ground]
    - 44. When you penetrate deeply into a country,
      - it is heavy ground.
  - [Light Ground]
    - When you penetrate but a little way,
      - it is light ground.
  - [Encircled Ground]
    - 45. When you have the enemy's strongholds on your rear, and narrow passes in front,
      - it is encircled ground.
  - [Desperate Ground]
    - When there is no place of refuge at all,
      - it is desperate ground.
- [Rules for Types of Ground]
  - 46. Therefore,
    - on dispersive ground,
      - I would inspire my men with unity of purpose.
    - On light ground,
      - I would see that there is close connection between all parts of my army.
    - On contentious ground,
      - I would hurry up my rear.
    - On wide ground,
      - I would keep a vigilant eye on my defenses.
    - On intersecting ground,
      - I would consolidate my alliances.
    - On heavy ground,
      - I would try to ensure a continuous stream of supplies.
    - On wasteland,
      - I would keep pushing on along the road.
    - On encircled ground,
      - I would block any way of retreat.
    - On desperate ground,
      - I would proclaim to my soldiers the hopelessness of saving their lives.
      - 51. For it is the soldier's disposition
        - to offer an obstinate resistance when surrounded,
        - to fight hard when he cannot help himself,
        - and to obey promptly when he has fallen into danger.

Mind Map 61: AoW Chapter XI-2 - THE NINE SITUATIONS - Part 2


[Rules of Communication]
We cannot enter into alliance with neighboring princes
until we are acquainted with their designs
We are not fit to lead an army on the march
unless we are familiar with the face of the country
--its mountains and forests,
its pitfalls and precipices,
its marshes and swamps.
We shall be unable to turn natural advantages to account
unless we make use of local guides.
[Principles]
53. To be ignored of any one of the following four or five principles does not befit a warlike prince.
54. When a powerful leader attacks a large state,
his commandership shows itself in preventing the concentration of the enemy's forces.
He overawes his opponents,
and their allies are prevented from joining against him.
55. Hence
he does not strive to ally himself with all and sundry,
nor does he foster the power of other states.
He carries out his own secret designs,
keeping his antagonists in awe.
Thus he is able to capture their cities and overthrow their kingdoms.
[Rewards]
Bestow rewards without regard to rule,
issue orders without regard to previous arrangements;
and you will be able to handle a whole army
as though you had to do with but a single man.
Confront your soldiers with the deed itself;
never let them know your design.
When the outlook is bright,
bring it before their eyes;
but tell them nothing when
the situation is gloomy.

Mind Map 62: AoW Chapter XI-2 - THE NINE SITUATIONS - Part 3



- [Communication with your Army]
  - Place your army in deadly peril,
    - and it will survive;
  - plunge it into desperate straits,
    - and it will come off in safety.
  - 59. For it is precisely when a force has fallen into harm's way
    - that is capable of striking a blow for victory.
- [Success in Warfare]
  - 60. Success in warfare is gained by carefully accommodating ourselves to the enemy's purpose.
  - 61. By persistently hanging on the enemy's flank,
    - we shall succeed in the long run in killing the commander-in-chief.
  - 62. This is called ability to accomplish a thing by sheer cunning.
  - 63. On the day that you take up your command,
    - block the frontier passes,
    - destroy the official tallies,
    - and stop the passage of all emissaries.
  - 64. Be stern in the council-chamber,
    - so that you may control the situation.
  - 65. If the enemy leaves a door open,
    - you must rush in.
  - 66. Forestall your opponent by seizing what he holds dear,
    - and subtly contrive to time his arrival on the ground.
  - 67. Walk in the path defined by rule, and accommodate yourself to the enemy
    - until you can fight a decisive battle.
  - 68. Then,
    - at first, exhibit the coyness of a maiden,
      - until the enemy gives you an opening;
    - afterwards, emulate the rapidity of a running hare,
      - and it will be too late for the enemy to oppose you.

Mind Map 63: AoW Chapter XI-2 - THE NINE SITUATIONS - Part 4

Details and Patterns

Skillful Commander

- **Pair of Opposites** in *Skillful Commander*
  - Par. 29: **head and tail**.
  - Par. 33: **strong and weak**.

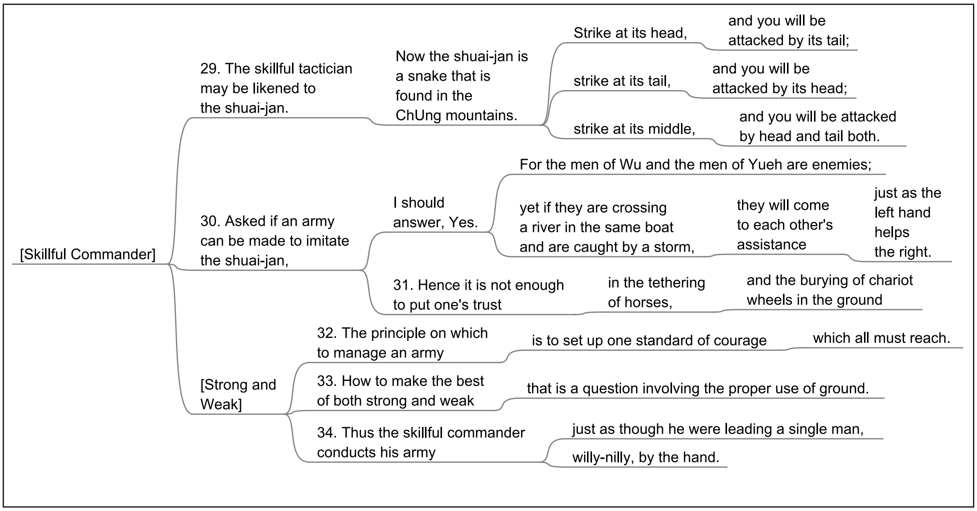

[Skillful Commander]
29. The skillful tactician may be likened to the shuai-jan.
Now the shuai-jan is a snake that is found in the ChUng mountains.
Strike at its head,
and you will be attacked by its tail;
strike at its tail,
and you will be attacked by its head;
strike at its middle,
and you will be attacked by head and tail both.
30. Asked if an army can be made to imitate the shuai-jan,
I should answer, Yes.
For the men of Wu and the men of Yueh are enemies;
yet if they are crossing a river in the same boat and are caught by a storm,
they will come to each other's assistance
just as the left hand helps the right.
31. Hence it is not enough to put one's trust
in the tethering of horses,
and the burying of chariot wheels in the ground
[Strong and Weak]
32. The principle on which to manage an army
is to set up one standard of courage
which all must reach.
33. How to make the best of both strong and weak
that is a question involving the proper use of ground.
34. Thus the skillful commander conducts his army
just as though he were leading a single man,
willy-nilly, by the hand.

Fig. 139: Skillful Commander

- **Conditional Sentences** in *Skillful Commander*, see figure 139
  - Par. 29:
    The skillful tactician may be likened to the shuai-jan.…
  - `=> Judge. (故)` ;

    the judgement is a metaphor including `3 (Cond. => Conseq.)`
  - Par. 30:
    Asked if an army can be made to imitate the shuai-jan,…
    `Cond. => Adv. ; Cond. => Conseq.`
  - Par. 31:
    Hence it is not enough to put one's trust…
    `=> Judge. (故)`
  - Par. 34:
    Thus the skillful commander conducts his army…
    `=> Judge. (故)`

Business of a Commander

- **Pairs of Opposites**

  - Par. 41: **Aggressive or defensive tactics**;
- **Metaphors**
  - Par. 38: **Kick a ladder**.

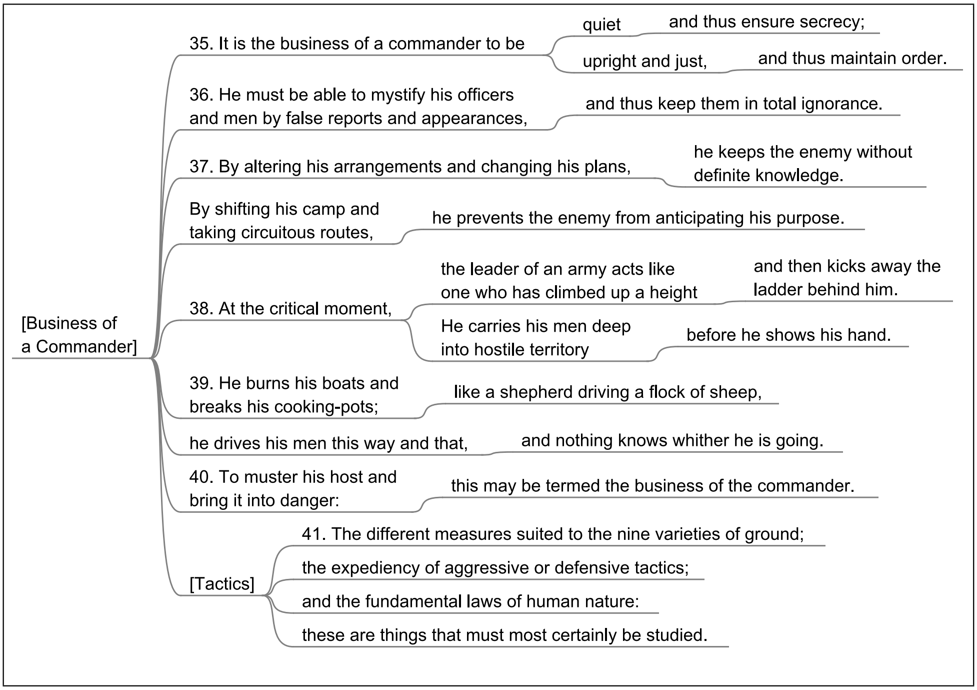

[Business of a Commander]
35. It is the business of a commander to be
quiet
and thus ensure secrecy;
upright and just,
and thus maintain order.
36. He must be able to mystify his officers and men by false reports and appearances,
and thus keep them in total ignorance.
37. By altering his arrangements and changing his plans,
he keeps the enemy without definite knowledge.
By shifting his camp and taking circuitous routes,
he prevents the enemy from anticipating his purpose.
38. At the critical moment,
the leader of an army acts like one who has climbed up a height
and then kicks away the ladder behind him.
He carries his men deep into hostile territory
before he shows his hand.
39. He burns his boats and breaks his cooking-pots;
like a shepherd driving a flock of sheep,
he drives his men this way and that,
and nothing knows whither he is going.
40. To muster his host and bring it into danger:
this may be termed the business of the commander.
[Tactics]
41. The different measures suited to the nine varieties of ground;
the expediency of aggressive or defensive tactics;
and the fundamental laws of human nature:
these are things that must most certainly be studied.

Fig. 140: Business of a Commander

- **Conditional Sentences** in *Business of a Commander*, see figure 140
  - Par. 35-36:
    `It is the business of a commander to be…` `3 Adv. => Conseq.` .
  - Par. 37:
    `By altering his arrangements…` `2 (Adv. => Conseq.)` .

Hostile Territory

- **Pairs of Opposites**
  - Par. 42: **Cohesion and Dispersion**.
  - Par. 44: **Heavy ground and Light ground**.
- **Definitions**
  - Par. 42-45: `6 Def.`

- **Conditional Sentence** in *Hostile Territory*, see figure 141
- Par. 42: `When invading hostile territory,…` `2 (Adv. => Conseq.)` ; Universal quantification with 凡.

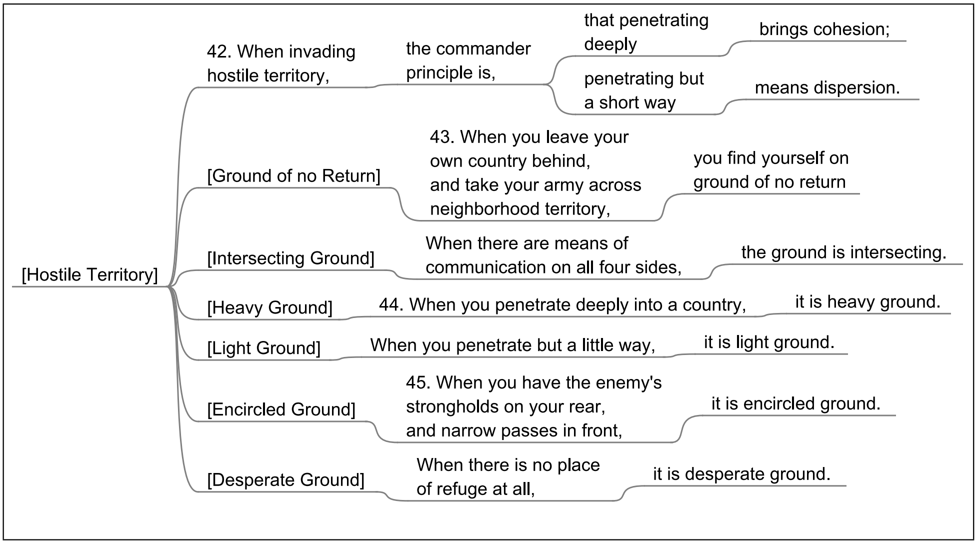

[Hostile Territory]
42. When invading hostile territory,
the commander principle is,
that penetrating deeply
brings cohesion;
penetrating but a short way
means dispersion.
[Ground of no Return]
43. When you leave your own country behind, and take your army across neighborhood territory,
you find yourself on ground of no return
[Intersecting Ground]
When there are means of communication on all four sides,
the ground is intersecting.
[Heavy Ground]
44. When you penetrate deeply into a country,
it is heavy ground.
[Light Ground]
When you penetrate but a little way,
it is light ground.
[Encircled Ground]
45. When you have the enemy's strongholds on your rear, and narrow passes in front,
it is encircled ground.
[Desperate Ground]
When there is no place of refuge at all,
it is desperate ground.

Fig. 141: Hostile Territory

Rules for Types of Ground

- **Conditional Sentences** in *Rules for Types of Ground*, see figure 142
  - Par. 46-50:
    `Therefore, on dispersive ground,…` `9 (Cond. => Adv.) (故)`.
  - Par. 51:
    `For it is the soldier's disposition…`
    `3 (Cond. => Adv.) (故)`.

Rules of Communication

- **Conditional Sentences** in *Rules of Communication*, see figure 143
  - Par. 52:
    `We cannot enter into alliance with neighboring princes…`
    `3 (Cond. => Conseq.) (故)`

Principles

- **Conditional Sentences** in *Principles*, see figure 144
  - Par. 54:
    `When a powerful leader attacks a large state…`
    `Cond. => 3 Conseq.`
  - Par. 55:
    `Hence, he does not strive to ally himself with all`

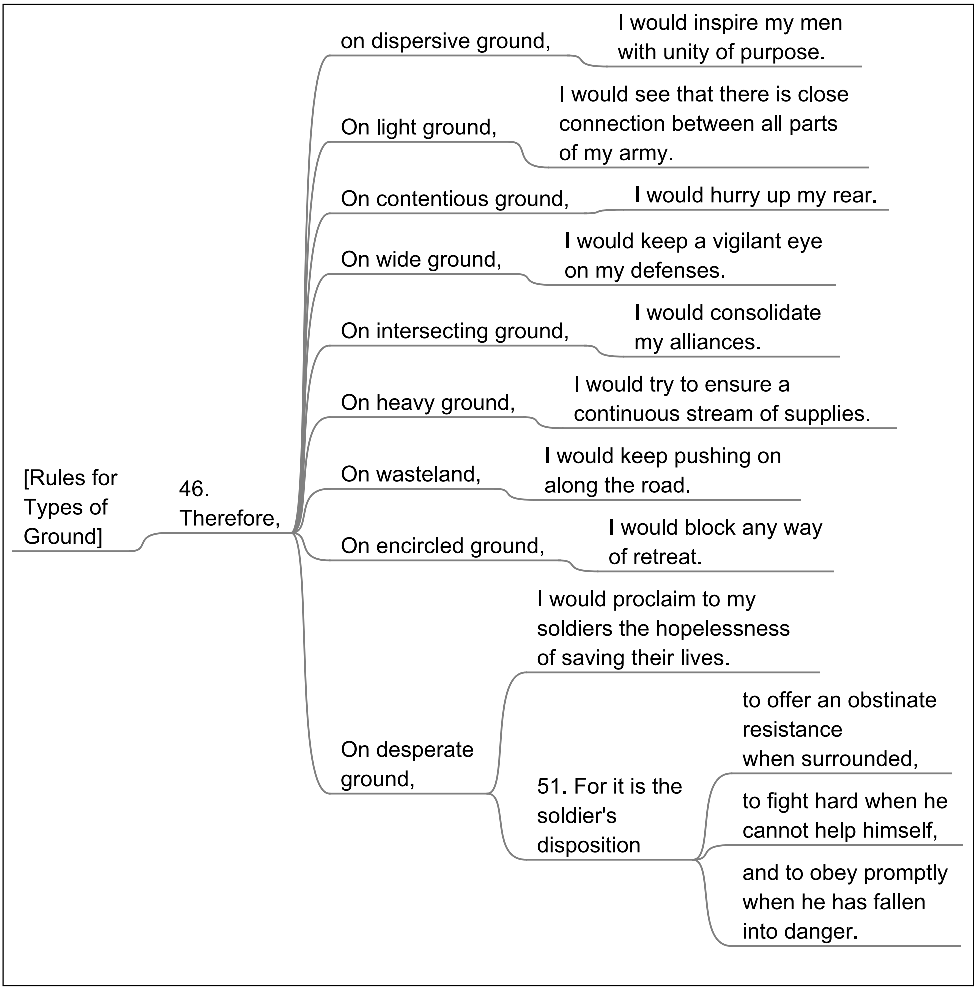

[Rules for Types of Ground]
46. Therefore,
on dispersive ground,
I would inspire my men with unity of purpose.
On light ground,
I would see that there is close connection between all parts of my army.
On contentious ground,
I would hurry up my rear.
On wide ground,
I would keep a vigilant eye on my defenses.
On intersecting ground,
I would consolidate my alliances.
On heavy ground,
I would try to ensure a continuous stream of supplies.
On wasteland,
I would keep pushing on along the road.
On encircled ground,
I would block any way of retreat.
On desperate ground,
I would proclaim to my soldiers the hopelessness of saving their lives.
51. For it is the soldier's disposition
to offer an obstinate resistance when surrounded,
to fight hard when he cannot help himself,
and to obey promptly when he has fallen into danger.

Fig. 142: Rules for Types of Ground

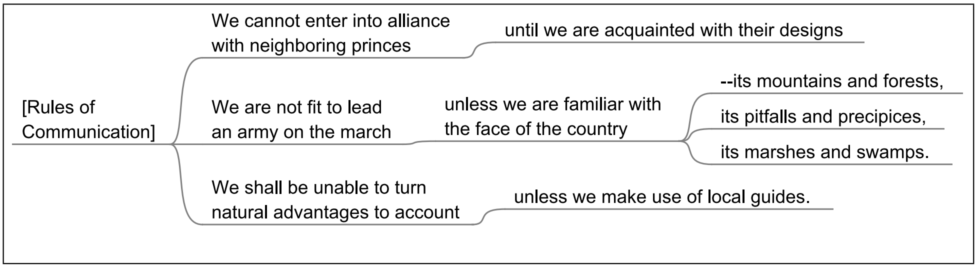

[Rules of Communication]
We cannot enter into alliance with neighboring princes
until we are acquainted with their designs
We are not fit to lead an army on the march
unless we are familiar with the face of the country
--its mountains and forests,
its pitfalls and precipices,
its marshes and swamps.
We shall be unable to turn natural advantages to account
unless we make use of local guides.

Fig. 143: Rules of Communication

```
and sundry,…
```

```
3 Adv. => Conseq. (故)
```

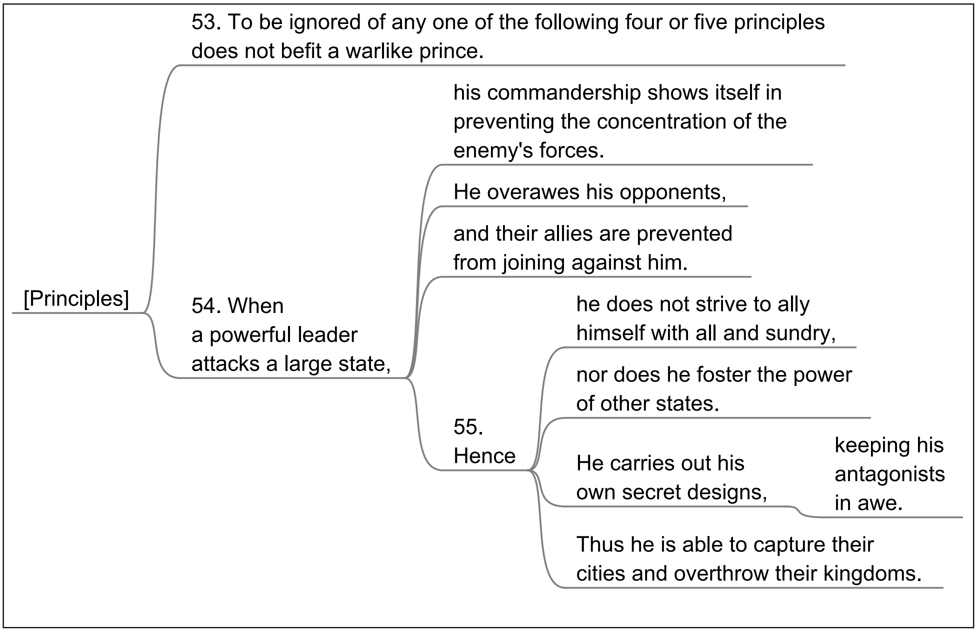

[Principles]
53. To be ignored of any one of the following four or five principles does not befit a warlike prince.
54. When a powerful leader attacks a large state,
his commandership shows itself in preventing the concentration of the enemy's forces.
He overawes his opponents,
and their allies are prevented from joining against him.
55. Hence
he does not strive to ally himself with all and sundry,
nor does he foster the power of other states.
He carries out his own secret designs,
keeping his antagonists in awe.
Thus he is able to capture their cities and overthrow their kingdoms.

Fig. 144: Principles

Rewards

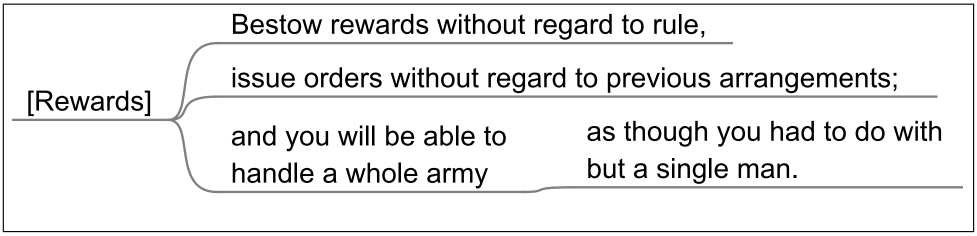

[Rewards]
Bestow rewards without regard to rule,
issue orders without regard to previous arrangements;
and you will be able to handle a whole army
as though you had to do with but a single man.

Fig. 145: Rewards

- **Conditional Sentences** in *Rewards*, see figure 145
  - Par. 56: `Bestow rewards without regard to rule,…`
    `2 Adv. => Cond`

Communication with your Army

- **Pairs of Opposites**
  - Par. 57: **bright or gloomy**.

- **Conditional Sentences** in *Communication with your Army*, see figure 146

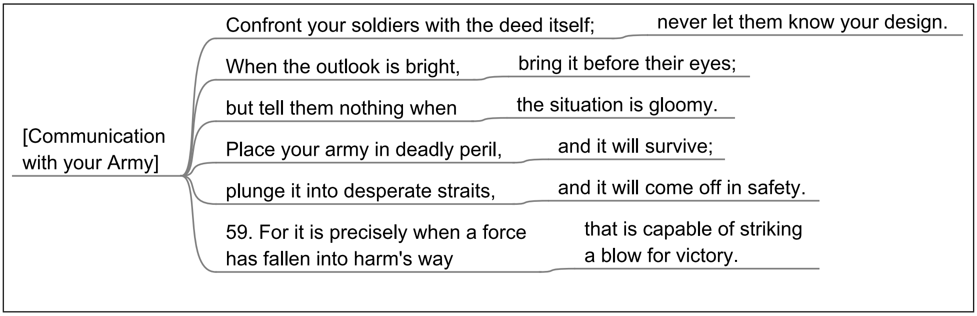

[Communication with your Army]
Confront your soldiers with the deed itself;
never let them know your design.
When the outlook is bright,
bring it before their eyes;
but tell them nothing when
the situation is gloomy.
Place your army in deadly peril,
and it will survive;
plunge it into desperate straits,
and it will come off in safety.
59. For it is precisely when a force has fallen into harm's way
that is capable of striking a blow for victory.

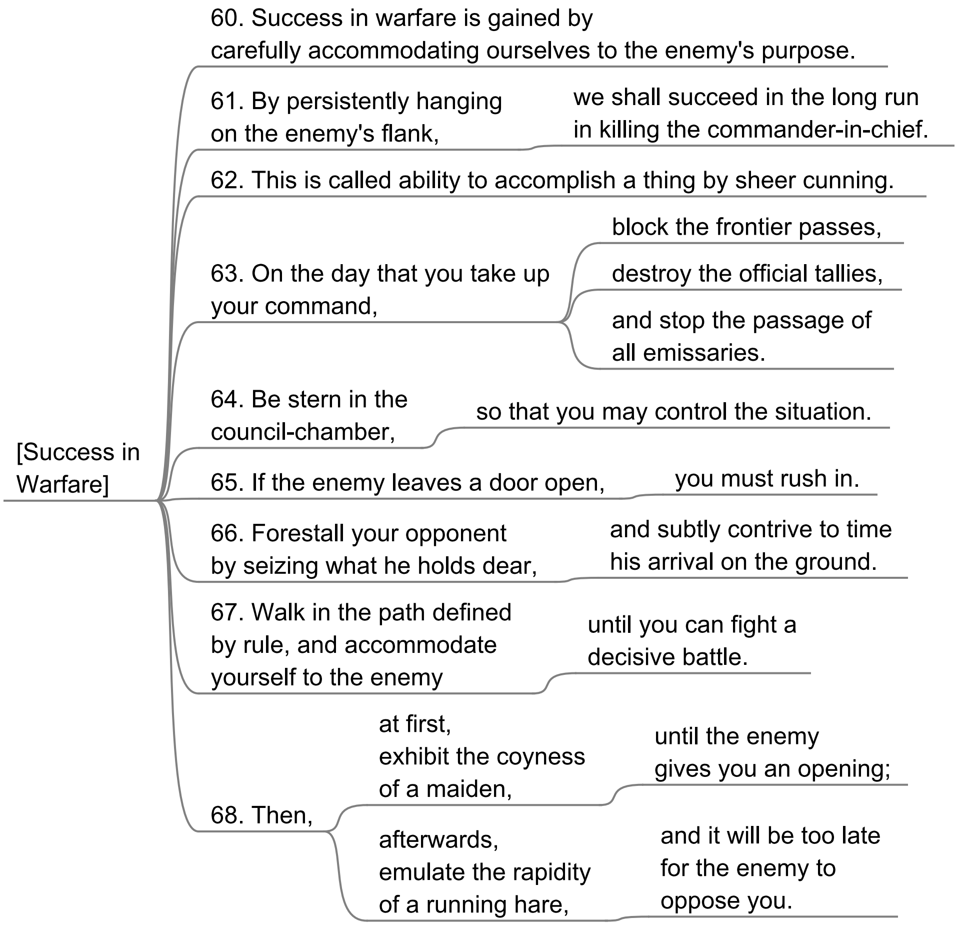
Fig. 146: Communication with your Army

- Par. 57:
  `Confront your soldiers with the deed itself…`
  `2(Cond. => Adv.)` , if-then-else construction.
- Par. 58:
  `Place your army in deadly peril, and it will survive;…`
  `2(Adv. => Conseq.)`
- Par. 59:
  `For it is precisely when a force has fallen into harm's way…`
  `Cond. => Conseq.`

Success in Warfare

- **Pairs of Opposites**
  - Par. 68: `Coyness of a maiden, Rapidity of a running hare.`
- **Metaphors**
  - Par. 68: `Coyness of a Maiden, Rapidity of a Running Hare.`

- **Conditional Sentences** in *Success in Warfare*, see figure 147
  - Par. 60: `Success in warfare is gained by carefully…`
    `=> Judge. (故)`
  - Par. 61: `By persistently hanging on the enemy's flank…`
    `Adv. => Conseq.`
  - Par. 63: `On the day that you take up your command,…`
    `Cond. => 3 Adv. (故)`
  - Par. 65: `If the enemy leaves a door open,…`
    `Conseq. => Adv.`
  - Par. 66-68:
    `Forestall your opponent by seizing what he holds dear,…`
    `6 Adv. => Conseq. (故)`



[Success in Warfare]

60. Success in warfare is gained by carefully accommodating ourselves to the enemy's purpose.

61. By persistently hanging on the enemy's flank, we shall succeed in the long run in killing the commander-in-chief.

62. This is called ability to accomplish a thing by sheer cunning.

63. On the day that you take up your command,
block the frontier passes,
destroy the official tallies,
and stop the passage of all emissaries.

64. Be stern in the council-chamber, so that you may control the situation.

65. If the enemy leaves a door open, you must rush in.

66. Forestall your opponent by seizing what he holds dear, and subtly contrive to time his arrival on the ground.

67. Walk in the path defined by rule, and accommodate yourself to the enemy until you can fight a decisive battle.

68. Then,
at first, exhibit the coyness of a maiden, until the enemy gives you an opening;
afterwards, emulate the rapidity of a running hare, and it will be too late for the enemy to oppose you.

Fig. 147: Success in Warfare

Structured Text

XI. THE NINE SITUATIONS - 2

- **Skillful Commander**

29. The skillful tactician may be likened to the shuai-jan.
» Now the shuai-jan is a snake that is found in the ChUng mountains.
° Strike at its head,
- and you will be attacked by its tail;
° strike at its tail,
- and you will be attacked by its head;
° strike at its middle,
- and you will be attacked by head and tail both.
30. Asked if an army can be made to imitate the shuai-jan,
» I should answer, Yes.
° For the men of Wu and the men of Yueh are enemies;
° yet if they are crossing a river in the same boat and are caught by a storm,
- they will come to each other's assistance
- just as the left hand helps the right.
» 31. Hence it is not enough to put one's trust
° in the tethering of horses,
- and the burying of chariot wheels in the ground
[Strong and Weak]
» 32. The principle on which to manage an army
° is to set up one standard of courage
- which all must reach.
» 33. How to make the best of both strong and weak--
° that is a question involving the proper use of ground.
» 34. Thus the skillful commander conducts his army
° just as though he were leading a single man,
° willy-nilly, by the hand.

- **Business of a Commander**

35. It is the business of a commander to be
» quiet
° and thus ensure secrecy;
» upright and just,
° and thus maintain order.
36. He must be able to mystify his officers and men by false reports and appearances,
» and thus keep them in total ignorance.
37. By altering his arrangements and changing his plans,
» he keeps the enemy without definite knowledge.
By shifting his camp and taking circuitous routes,
» he prevents the enemy from anticipating his purpose.
38. At the critical moment,

» the leader of an army acts like one who has climbed up a height
° and then kicks away the ladder behind him.
» He carries his men deep into hostile territory
° before he shows his hand.
39. He burns his boats and breaks his cooking-pots;
» like a shepherd driving a flock of sheep,
he drives his men this way and that,
» and nothing knows whither he is going.
40. To muster his host and bring it into danger:--
» this may be termed the business of the commander.
[Tactics]
» 41. The different measures suited to the nine varieties of ground;
» the expediency of aggressive or defensive tactics;
» and the fundamental laws of human nature:
» these are things that must most certainly be studied.

- **Hostile Territory**

42. When invading hostile territory,
» the commander principle is,
° that penetrating deeply
- brings cohesion;
° penetrating but a short way
- means dispersion.
[Ground of no Return]
» 43. When you leave your own country behind, and take your army across neighborhood territory,
° you find yourself on ground of no return
[Intersecting Ground]
» When there are means of communication on all four sides,
° the ground is intersecting.
[Heavy Ground]
» 44. When you penetrate deeply into a country,
° it is heavy ground.
[Light Ground]
» When you penetrate but a little way,
° it is light ground.
[Encircled Ground]
» 45. When you have the enemy's strongholds on your rear, and narrow passes in front,
° it is encircled ground.
[Desperate Ground]
» When there is no place of refuge at all,
° it is desperate ground.

- **Rules for Types of Ground**

46. Therefore,
» on dispersive ground,
° I would inspire my men with unity of purpose.
» On light ground,
° I would see that there is close connection

```
      between all parts of my army.
  » On contentious ground,
    ° I would hurry up my rear.
  » On wide ground,
    ° I would keep a vigilant eye on my defenses.
  » On intersecting ground,
    ° I would consolidate my alliances.
  » On heavy ground,
    ° I would try to ensure a continuous stream of
      supplies.
  » On wasteland,
    ° I would keep pushing on along the road.
  » On encircled ground,
    ° I would block any way of retreat.
  » On desperate ground,
    ° I would proclaim to my soldiers the hopelessness
      of saving their lives.
    ° 51. For it is the soldier's disposition
      - to offer an obstinate resistance when
        surrounded,
      - to fight hard when he cannot help himself,
      - and to obey promptly when he has fallen into
        danger.
```

- **Rules of Communication**

```
52. We cannot enter into alliance with neighboring princes
  » until we are acquainted with their designs
We are not fit to lead an army on the march
  » unless we are familiar with the face of the country
    ° --its mountains and forests,
    ° its pitfalls and precipices,
    ° its marshes and swamps.
We shall be unable to turn natural advantages to account
  » unless we make use of local guides.
```

- **Principles**

```
53. To be ignored of any one of the following four or
five principles does not befit a warlike prince.
54. When a powerful leader attacks a large state,
  » his commandership shows itself in preventing the
    concentration of the enemy's forces.
  » He overawes his opponents,
  » and their allies are prevented from joining against
    him.
  » 55. Hence
    ° he does not strive to ally himself with all and
      sundry,
    ° nor does he foster the power of other states.
    ° He carries out his own secret designs,
      - keeping his antagonists in awe.
    ° Thus he is able to capture their cities and
      overthrow their kingdoms.
```

- **Rewards**

Bestow rewards without regard to rule,
issue orders without regard to previous arrangements;
and you will be able to handle a whole army
  » as though you had to do with but a single man.

- **Communication with your Army**

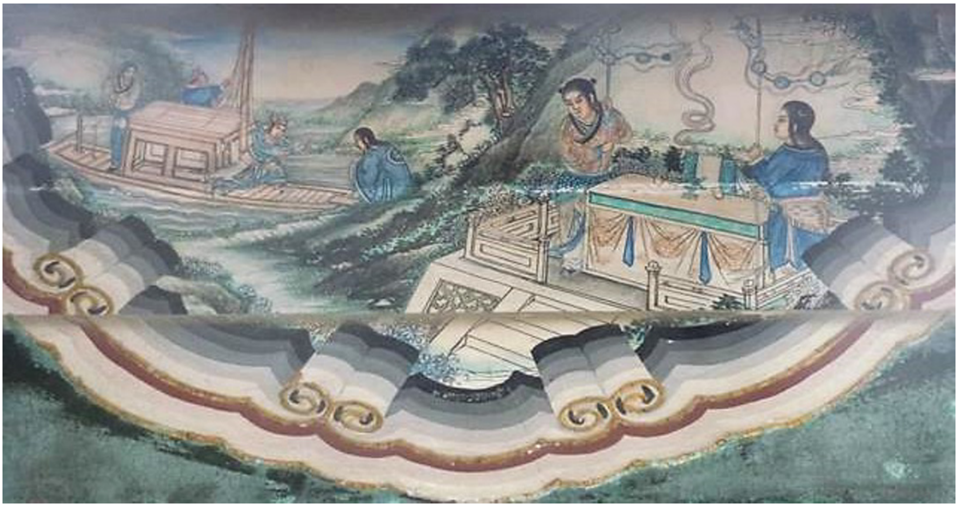
57. Confront your soldiers with the deed itself;
  » never let them know your design.
When the outlook is bright,
  » bring it before their eyes;
but tell them nothing when
  » the situation is gloomy.
Place your army in deadly peril,
  » and it will survive;
plunge it into desperate straits,
  » and it will come off in safety.
59. For it is precisely when a force has fallen into harm's way
  » that is capable of striking a blow for victory.

- **Success in Warfare**

60. Success in warfare is gained by carefully accommodating ourselves to the enemy's purpose.
61. By persistently hanging on the enemy's flank,
  » we shall succeed in the long run in killing the commander-in-chief.
62. This is called ability to accomplish a thing by sheer cunning.
63. On the day that you take up your command,
  » block the frontier passes,
  » destroy the official tallies,
  » and stop the passage of all emissaries.
64. Be stern in the council-chamber,
  » so that you may control the situation.
65. If the enemy leaves a door open,
  » you must rush in.
66. Forestall your opponent by seizing what he holds dear,
  » and subtly contrive to time his arrival on the ground.
67. Walk in the path defined by rule, and accommodate yourself to the enemy
  » until you can fight a decisive battle.
68. Then
  » at first, exhibit the reluctance of a maiden,
    ° until the enemy gives you an opening;
  » afterwards emulate the rapidity of a running hare,
    ° and it will be too late for the enemy to oppose you.

XII. THE ATTACK BY FIRE - 火攻

Abstract In this chapter Sun Tzu gives very specific advice how to attack with fire and he briefly also talks about water.



Zhuge Liang sacrificing to the wind from the seven-star altar.

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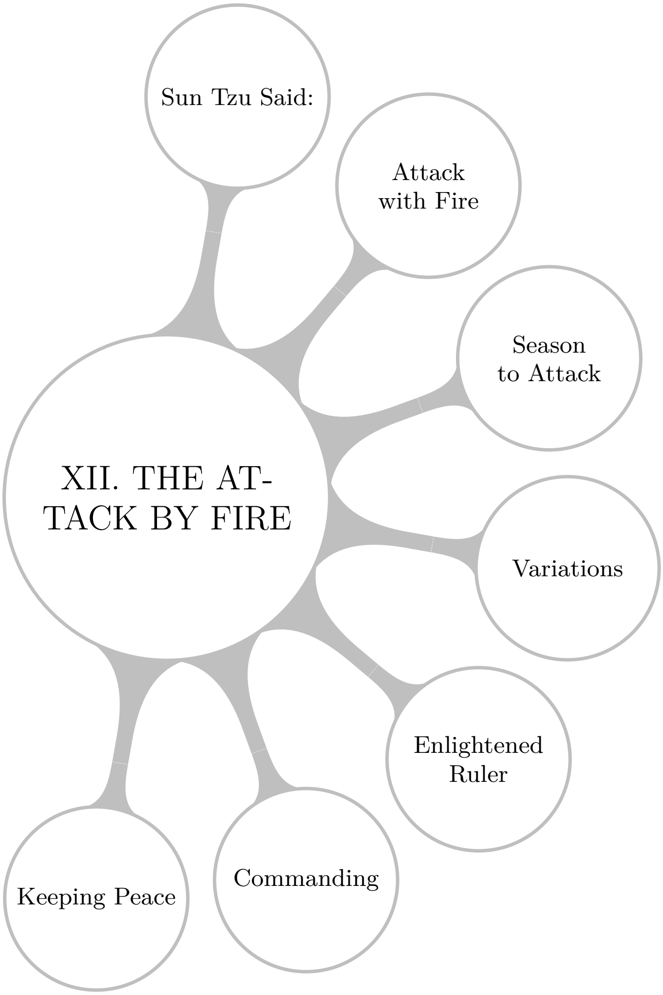
P. van Emde Boas et al., *Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps*, Logic in Asia: Studia Logica Library,
https://doi.org/10.1007/978-981-19-6250-9_23

Main Concepts


Sun Tzu Said:
Attack with Fire
Season to Attack
XII. THE ATTACK BY FIRE
Variations
Enlightened Ruler
Keeping Peace
Commanding

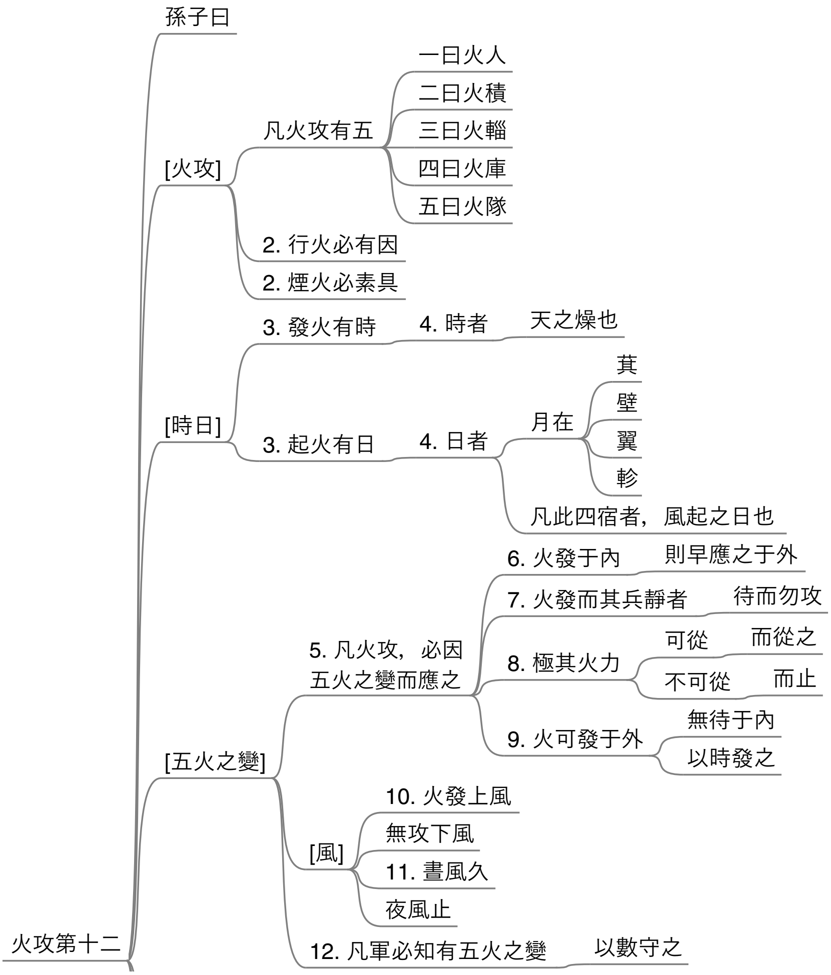
The first part of this chapter is indeed about what can happen when fire breaks out and how to attack with fire:

- par 1: There are five ways to attack by fire …
- par 5: In attacking with fire, one should be prepared to meet five possible developments …

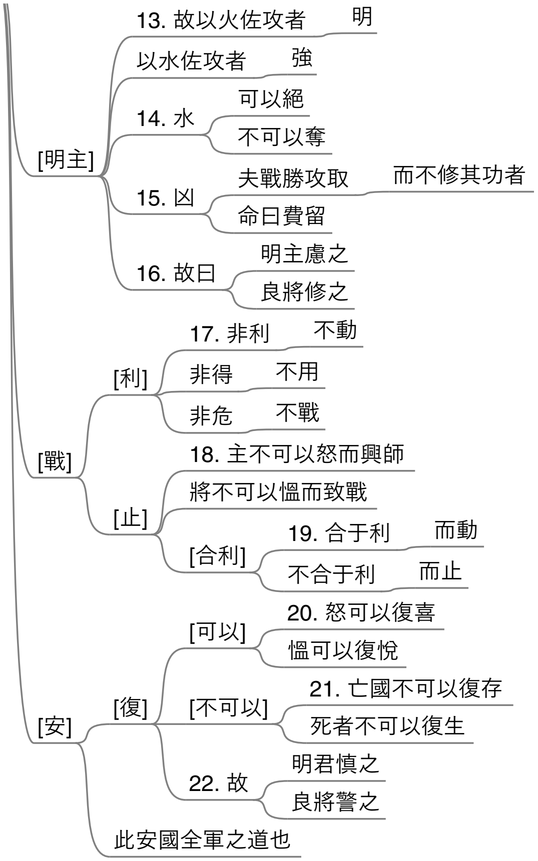
The end of the chapter contains more general rules for the commander to follow.

Mind Maps

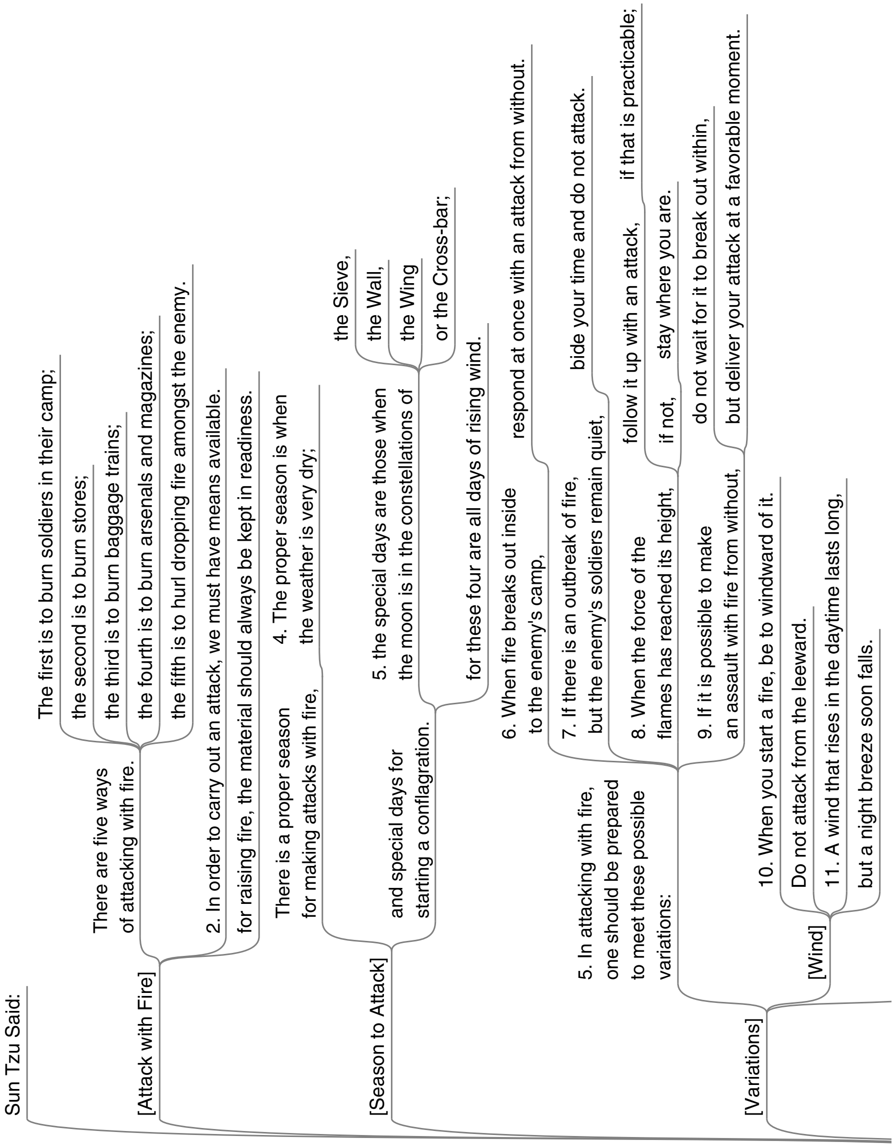
The overview for this chapter can be found in mind map figures 64 to 67.


火攻第十二
孫子曰
[火攻]
凡火攻有五
一曰火人
二曰火積
三曰火輜
四曰火庫
五曰火隊
2. 行火必有因
2. 煙火必素具
[時日]
3. 發火有時
4. 時者
天之燥也
3. 起火有日
4. 日者
月在
箕
壁
翼
軫
凡此四宿者，風起之日也
[五火之變]
5. 凡火攻，必因五火之變而應之
6. 火發于內
則早應之于外
7. 火發而其兵靜者
待而勿攻
8. 極其火力
可從
而從之
不可從
而止
9. 火可發于外
無待于內
以時發之
[風]
10. 火發上風
無攻下風
11. 畫風久
夜風止
12. 凡軍必知有五火之變
以數守之

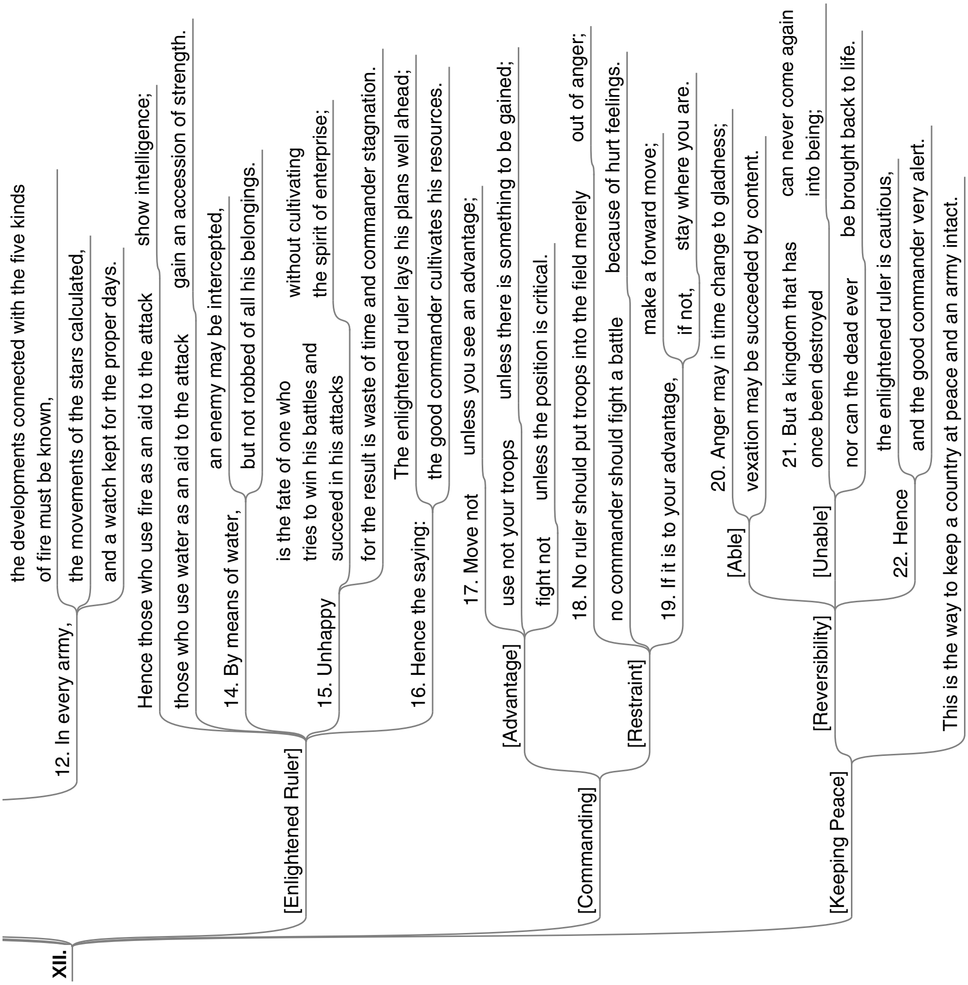
Mind Map 64: AoW Chapter XII - Chinese Mind Map, part 1


13. 故以火佐攻者
明
以水佐攻者
強
14. 水
可以絕
不可以奪
[明主]
15. 凶
夫戰勝攻取
而不修其功者
命曰費留
16. 故曰
明主慮之
良將修之
17. 非利
不動
[利]
非得
不用
非危
不戰
[戰]
18. 主不可以怒而興師
將不可以慍而致戰
[止]
[合利]
19. 合于利
而動
不合于利
而止
20. 怒可以復喜
[可以]
慍可以復悅
[安]
[復]
[不可以]
21. 亡國不可以復存
死者不可以復生
22. 故
明君慎之
良將警之
此安國全軍之道也

Mind Map 65: AoW Chapter XII - Chinese Mind Map, part 2


Sun Tzu Said:
[Attack with Fire]
There are five ways of attacking with fire.
The first is to burn soldiers in their camp;
the second is to burn stores;
the third is to burn baggage trains;
the fourth is to burn arsenals and magazines;
the fifth is to hurl dropping fire amongst the enemy.
2. In order to carry out an attack, we must have means available.
for raising fire, the material should always be kept in readiness.
[Season to Attack]
There is a proper season for making attacks with fire,
4. The proper season is when the weather is very dry;
and special days for starting a conflagration.
5. the special days are those when the moon is in the constellations of
the Sieve,
the Wall,
the Wing
or the Cross-bar;
for these four are all days of rising wind.
[Variations]
5. In attacking with fire, one should be prepared to meet these possible variations:
6. When fire breaks out inside to the enemy's camp,
respond at once with an attack from without.
7. If there is an outbreak of fire, but the enemy's soldiers remain quiet,
bide your time and do not attack.
8. When the force of the flames has reached its height,
follow it up with an attack,
if that is practicable;
if not,
stay where you are.
9. If it is possible to make an assault with fire from without,
do not wait for it to break out within,
but deliver your attack at a favorable moment.
[Wind]
10. When you start a fire, be to windward of it.
Do not attack from the leeward.
11. A wind that rises in the daytime lasts long,
but a night breeze soon falls.

Mind Map 66: Aow Ch. XII, the English Mind Map - Part 1


XII.
12. In every army,
the developments connected with the five kinds
of fire must be known,
the movements of the stars calculated,
and a watch kept for the proper days.
[Enlightened Ruler]
Hence those who use fire as an aid to the attack
show intelligence;
those who use water as an aid to the attack
gain an accession of strength.
14. By means of water,
an enemy may be intercepted,
but not robbed of all his belongings.
15. Unhappy
is the fate of one who
tries to win his battles and
succeed in his attacks
without cultivating
the spirit of enterprise;
for the result is waste of time and commander stagnation.
16. Hence the saying:
The enlightened ruler lays his plans well ahead;
the good commander cultivates his resources.
[Commanding]
[Advantage]
17. Move not
unless you see an advantage;
use not your troops
unless there is something to be gained;
fight not
unless the position is critical.
[Restraint]
18. No ruler should put troops into the field merely
out of anger;
no commander should fight a battle
because of hurt feelings.
19. If it is to your advantage,
make a forward move;
if not,
stay where you are.
[Keeping Peace]
[Reversibility]
[Able]
20. Anger may in time change to gladness;
vexation may be succeeded by content.
[Unable]
21. But a kingdom that has
once been destroyed
can never come again
into being;
nor can the dead ever
be brought back to life.
22. Hence
the enlightened ruler is cautious,
and the good commander very alert.
This is the way to keep a country at peace and an army intact.

Mind Map 67: Aow Ch. XII, the English Mind Map - Part 2

Details and Patterns

We could not find any *metaphor* patterns in this chapter.

Sun Tzu Said:

This is a chapter full of guidelines how to handle fire. According to Mair, see [46, page 29], this is one of the last chapters written, and together with AoW Ch.XIII, a chapter that deals with specialized topics.

As Giles [25] remarks:

> [Rather more than half the chapter (§§ 1-13) is devoted to the subject of fire, after which the author branches off into other topics.]

- **Conditional Sentences**
  - Par. 1: Universal quantification 凡

Attack with Fire

The chapter starts with an *enumeration pattern*, a list of 5 things you can burn to attack the enemy.

- **Enumeration**
  - Par. 1: **5 Ways of Attacking with Fire**, see the mind map detail in figure 148.

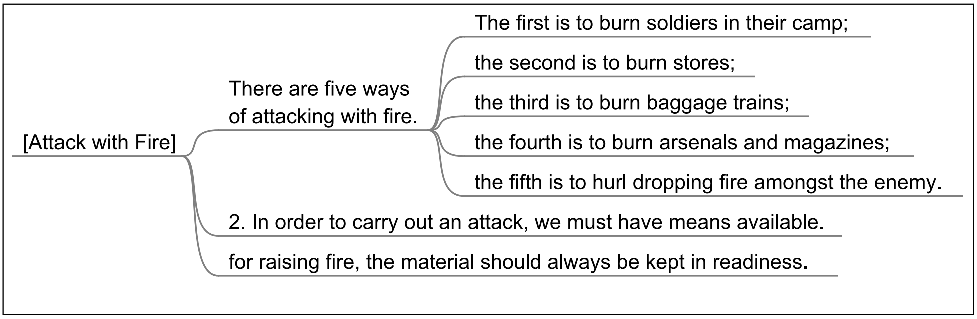

[Attack with Fire]
There are five ways of attacking with fire.
The first is to burn soldiers in their camp;
the second is to burn stores;
the third is to burn baggage trains;
the fourth is to burn arsenals and magazines;
the fifth is to hurl dropping fire amongst the enemy.
2. In order to carry out an attack, we must have means available.
for raising fire, the material should always be kept in readiness.

Fig. 148: Attack with Fire

Season to Attack

The four seasons that are suitable for attack, are *the Sieve, the Wall, the Wing* and *the Crossbar*. Giles [25] explains this as:

> [These are, respectively, the 7th, 14th, 27th, and 28th of the Twenty-eight Stellar Mansions, corresponding roughly to Sagittarius, Pegasus, Crater and Corvus.]

Other translators, for example Mair [46, footnote 3, page 159], have slightly different names and similar explanations.

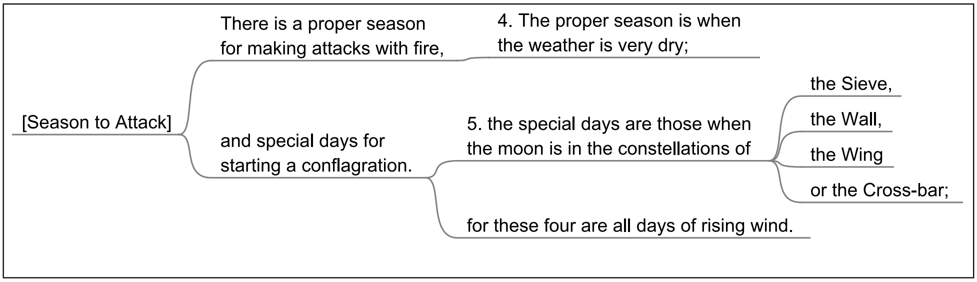

[Season to Attack]
There is a proper season for making attacks with fire,
4. The proper season is when the weather is very dry;
and special days for starting a conflagration.
5. the special days are those when the moon is in the constellations of
the Sieve,
the Wall,
the Wing
or the Cross-bar;
for these four are all days of rising wind.

Fig. 149: Season to Attack

Variations

The Giles translation seemingly provides another enumeration of five things here. however, very probably the number five refers back to the five types of fire. The variations in responding to those are explained.

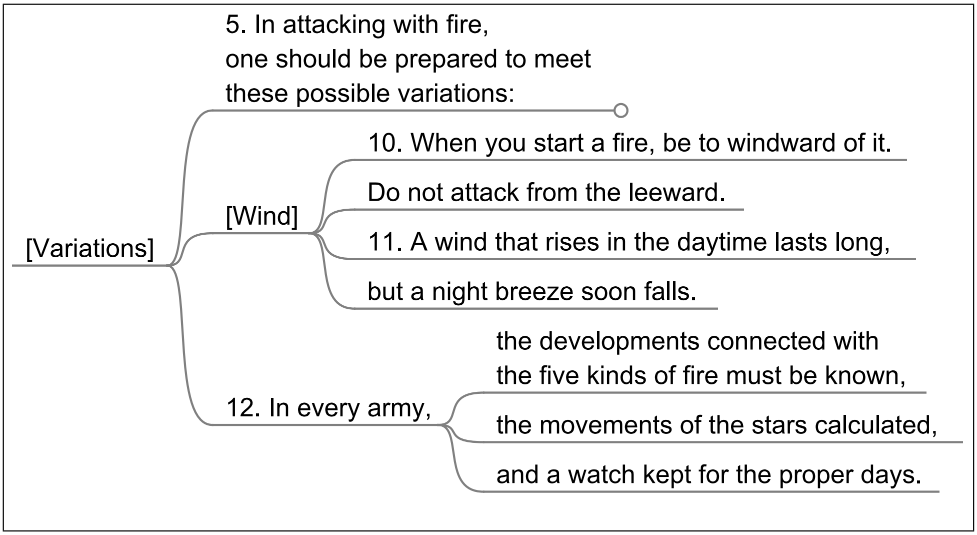

[Variations]
5. In attacking with fire, one should be prepared to meet these possible variations:
[Wind]
10. When you start a fire, be to windward of it.
Do not attack from the leeward.
11. A wind that rises in the daytime lasts long,
but a night breeze soon falls.
12. In every army,
the developments connected with the five kinds of fire must be known,
the movements of the stars calculated,
and a watch kept for the proper days.

Fig. 150: Variations

Sun Tzu mentions ways fire can be made to break out in the enemy's camp, how wind can influence the fire, and that every army should know the rules about handling fire.

- **Conditional Sentences** in *Variations*, see figure 150 and 151

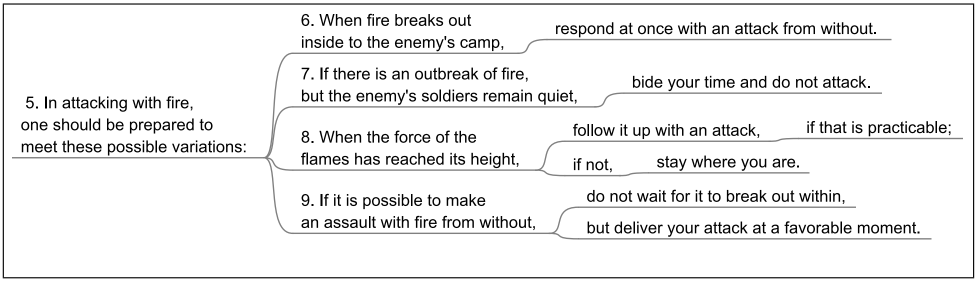

5. In attacking with fire,
one should be prepared to
meet these possible variations:
6. When fire breaks out
inside to the enemy's camp,
respond at once with an attack from without.
7. If there is an outbreak of fire,
but the enemy's soldiers remain quiet,
bide your time and do not attack.
8. When the force of the
flames has reached its height,
follow it up with an attack,
if that is practicable;
if not,
stay where you are.
9. If it is possible to make
an assault with fire from without,
do not wait for it to break out within,
but deliver your attack at a favorable moment.

Fig. 151: Variations, Details

- Par. 6: When fire breaks out inside to the enemy's camp…
  `Cond. => Adv.`
- Par. 7: If there is an outbreak of fire, but the enemy's…
  `Cond. => Adv.`
- Par. 8: When the force of the flames has reached its height…
  `2 (Cond. => Adv.)` , if-then-else construction.
- Par. 9:
  If it is possible to make an assault with fire from without…
  `Cond. => 2 Adv.`
- Par. 10: When you start a fire, be to windward of it.…
  `Cond. => 2 Adv.`
- Par. 12-13:
  In every army, the developments connected with
  the five kinds of fire must be known…
  `=> Judge. (故)` ;

Enlightened Ruler

The enlightened ruler knows how to use the *pair opposites*:

- par 13: **Fire and Water**.

- **Conditional Sentences** in *Enlightened Ruler*, see figure 152
  - Par. 15:
    Unhappy is the fate of one who tries to win his battles…
    `Cond. => Conseq.` .
  - Par. 16: Hence the saying:…
    `=> Judge. (故)` .

```
Hence the saying:
» The enlightened ruler lays his plans well ahead;
» the good commander cultivates his resources.
```

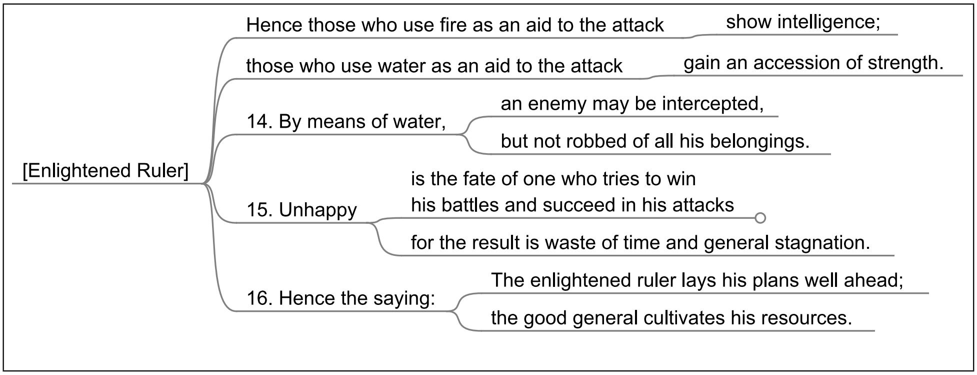

[Enlightened Ruler]
Hence those who use fire as an aid to the attack
show intelligence;
those who use water as an aid to the attack
gain an accession of strength.
14. By means of water,
an enemy may be intercepted,
but not robbed of all his belongings.
15. Unhappy
is the fate of one who tries to win
his battles and succeed in his attacks
for the result is waste of time and general stagnation.
16. Hence the saying:
The enlightened ruler lays his plans well ahead;
the good general cultivates his resources.

Fig. 152: Enlightened Ruler

Commanding

A *pair of opposites*:

- par 19: **Move and Stay**.

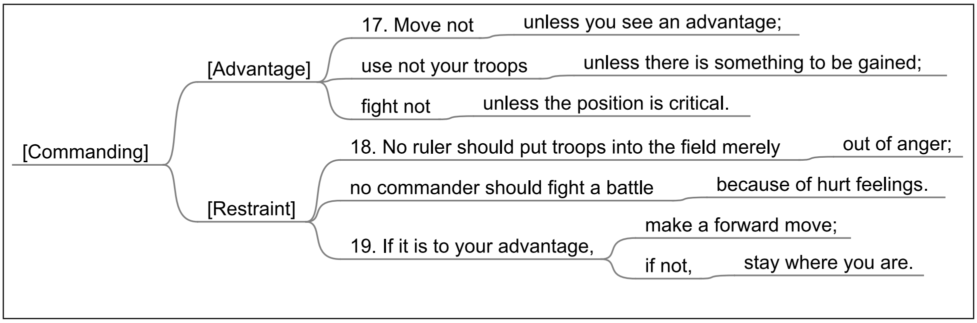

[Commanding]
[Advantage]
17. Move not
unless you see an advantage;
use not your troops
unless there is something to be gained;
fight not
unless the position is critical.
[Restraint]
18. No ruler should put troops into the field merely
out of anger;
no commander should fight a battle
because of hurt feelings.
19. If it is to your advantage,
make a forward move;
if not,
stay where you are.

Fig. 153: Commanding

- **Conditional Sentences** in *Commanding*, see figure 153
  - Par. 19: `If it is to your advantage…` `2(Cond. => Adv.)` , if-then-else construction.

Keeping Peace

A *pair of opposites*:

- par 21: **Destroyed and Being; Death and Life**.

- **Conditional Sentences** in *Keeping Peace*, see figure 154
  - Par. 22: `Hence the enlightened ruler is cautious…` `=> Judge. (故)` ; 也 indicates the essence of the sentence.

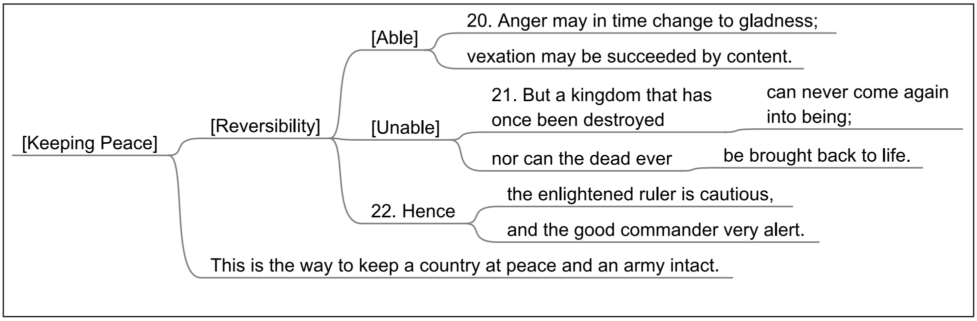

[Keeping Peace]
[Reversibility]
[Able]
20. Anger may in time change to gladness;
vexation may be succeeded by content.
[Unable]
21. But a kingdom that has once been destroyed
can never come again into being;
nor can the dead ever
be brought back to life.
22. Hence
the enlightened ruler is cautious,
and the good commander very alert.
This is the way to keep a country at peace and an army intact.

Fig. 154: Keeping Peace

Structured Text

XII. THE ATTACK BY FIRE

- **Sun Tzu Said:**

- **Attack with Fire**

  There are five ways of attacking with fire.
    » The first is to burn soldiers in their camp;
    » the second is to burn stores;
    » the third is to burn baggage trains;
    » the fourth is to burn arsenals and magazines;
    » the fifth is to hurl dropping fire amongst the enemy.
  2. In order to carry out an attack, we must have means available.
  for raising fire, the material should always be kept in readiness.

- **Season to Attack**

  There is a proper season for making attacks with fire,
    » 4. The proper season is when the weather is very dry;
  and special days for starting a conflagration.
    » 5. the special days are those when the moon is in the constellations of
      ° the Sieve,
      ° the Wall,
      ° the Wing
      ° or the Cross-bar;
    » for these four are all days of rising wind.

- **Variations**

  5. In attacking with fire, one should be prepared to meet these possible variations:
    » 6. When fire breaks out inside to the enemy's camp,
      ° respond at once with an attack from without.
    » 7. If there is an outbreak of fire, but the enemy's soldiers remain quiet,
      ° bide your time and do not attack.
    » 8. When the force of the flames has reached its height,
      ° follow it up with an attack,
        - if that is practicable;
      ° if not,
        - stay where you are.
    » 9. If it is possible to make an assault with fire from without,
      ° do not wait for it to break out within,
      ° but deliver your attack at a favorable moment.
  [Wind]
    » 10. When you start a fire, be to windward of it.

- » Do not attack from the leeward.
- » 11. A wind that rises in the daytime lasts long,
- » but a night breeze soon falls.

12. In every army,
- » the developments connected with the five kinds of fire must be known,
- » the movements of the stars calculated,
- » and a watch kept for the proper days.

- **Enlightened Ruler**

Hence those who use fire as an aid to the attack
- » show intelligence;

those who use water as an aid to the attack
- » gain an accession of strength.

14. By means of water,
- » an enemy may be intercepted,
- » but not robbed of all his belongings.

15. Unhappy
- » is the fate of one who tries to win his battles and succeed in his attacks
  - ° without cultivating the spirit of enterprise;
- » for the result is waste of time and commander stagnation.

16. Hence the saying:
- » The enlightened ruler lays his plans well ahead;
- » the good commander cultivates his resources.

- **Commanding**

[Advantage]
- » 17. Move not
  - ° unless you see an advantage;
- » use not your troops
  - ° unless there is something to be gained;
- » fight not
  - ° unless the position is critical.

[Restraint]
- » 18. No ruler should put troops into the field merely
  - ° out of anger;
- » no commander should fight a battle
  - ° because of hurt feelings.
- » 19. If it is to your advantage,
  - ° make a forward move;
  - ° if not,
    - - stay where you are.

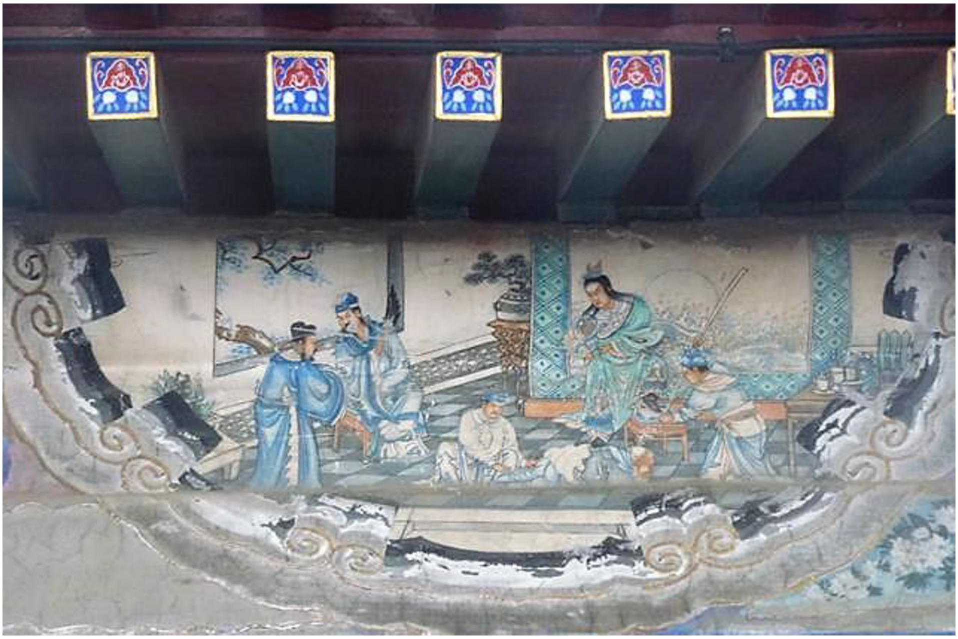
- **Keeping Peace**

[Reversibility]
- » [Able]
  - ° 20. Anger may in time change to gladness;
  - ° vexation may be succeeded by content.
- » [Unable]
  - ° 21. But a kingdom that has once been destroyed
    - - can never come again into being;

```
    ° nor can the dead ever
      - be brought back to life.
  » 22. Hence
    ° the enlightened ruler is cautious,
    ° and the good commander very alert.
This is the way to keep a country at peace and an army
intact.
```

XIII. THE USE OF SPIES - 用間

Abstract This chapter presents remarkable insight in the role of information and the way to obtain it. Sun Tzu describes five different types of spies whose roles vary between obtaining information from the enemy to planting false information with him.



Huang Gai's self-torturing to win the enemy's trust.

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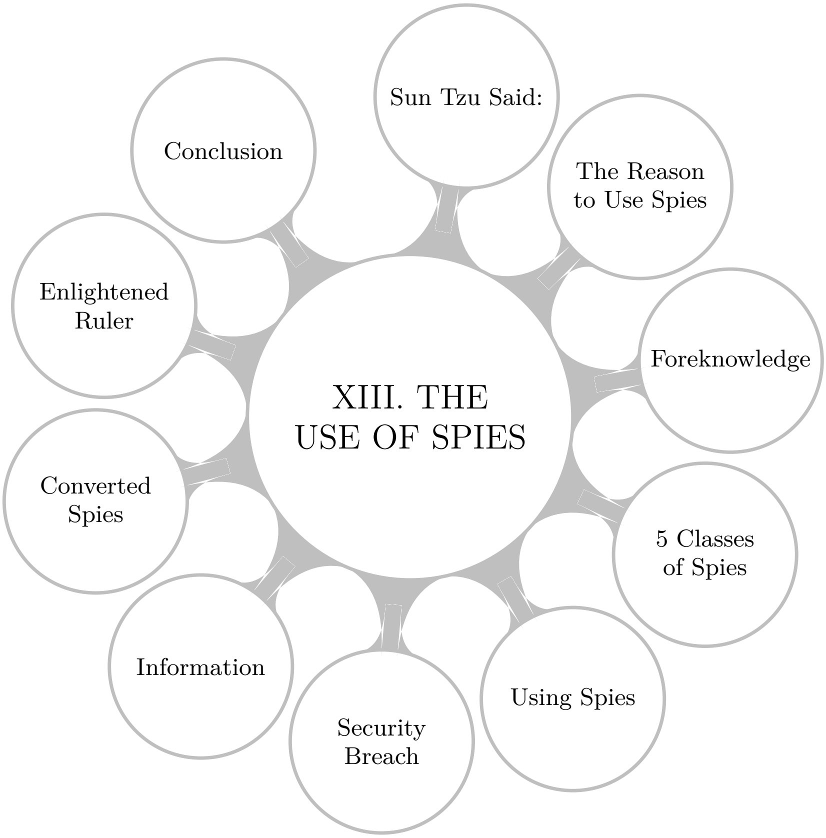
P. van Emde Boas et al., *Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps*, Logic in Asia: Studia Logica Library,
https://doi.org/10.1007/978-981-19-6250-9_24

Main Concepts


XIII. THE USE OF SPIES
Sun Tzu Said:
The Reason to Use Spies
Foreknowledge
5 Classes of Spies
Using Spies
Security Breach
Information
Converted Spies
Enlightened Ruler
Conclusion

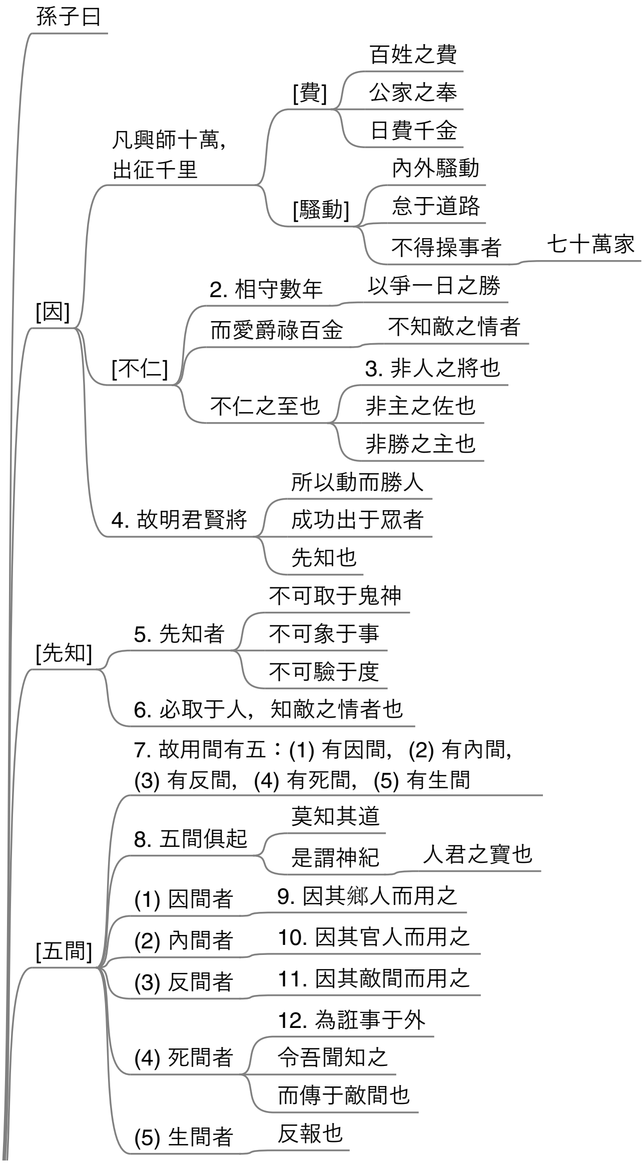
This is the last chapter in Sun Tzu's **Art of War**. It seems that it is also the last chapter written, about 272 B.C. That is likely, because the subject of this chapter, **spies**, is not described elsewhere in the book.

Some remarkable quotes from this chapter are:

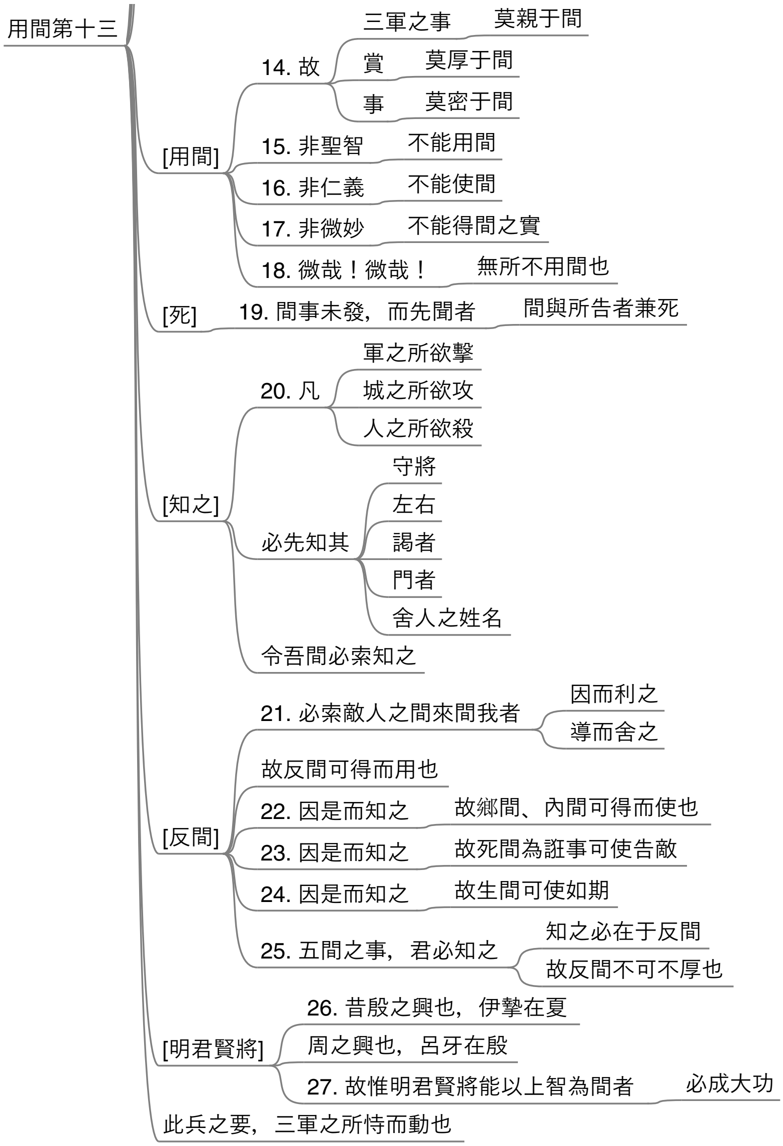
- Now this foreknowledge cannot be elicited from spirits; it cannot be obtained inductively from experience, nor by any deductive calculation.
- Knowledge of the enemy's dispositions can only be obtained from other men.

Mind Maps

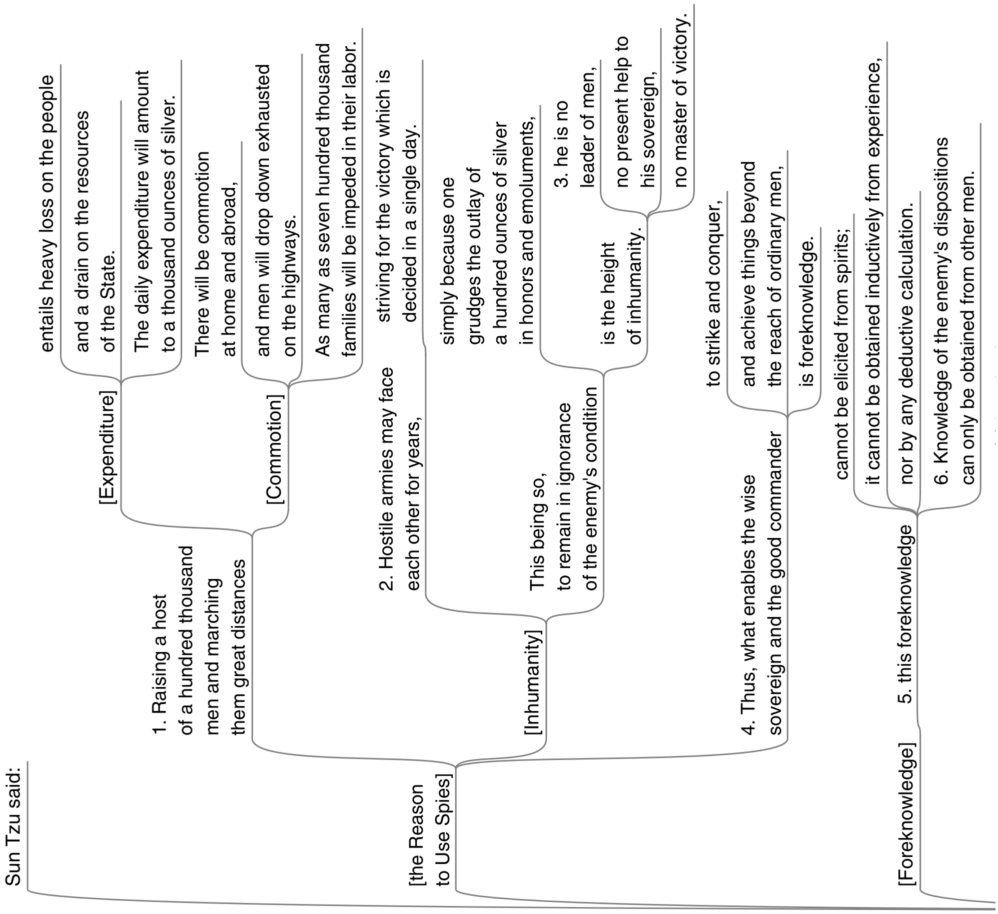
The overview for this chapter can be found in mind map figures 68 to 73.


孫子曰
[因]
凡興師十萬，
出征千里
[費]
百姓之費
公家之奉
日費千金
[騷動]
內外騷動
怠于道路
不得操事者
七十萬家
[不仁]
2. 相守數年
以爭一日之勝
而愛爵祿百金
不知敵之情者
不仁之至也
3. 非人之將也
非主之佐也
非勝之主也
4. 故明君賢將
所以動而勝人
成功出于眾者
先知也
[先知]
5. 先知者
不可取于鬼神
不可象于事
不可驗于度
6. 必取于人，知敵之情者也
[五間]
7. 故用間有五：(1) 有因間，(2) 有內間，
(3) 有反間，(4) 有死間，(5) 有生間
8. 五間俱起
莫知其道
是謂神紀
人君之寶也
(1) 因間者
9. 因其鄉人而用之
(2) 內間者
10. 因其官人而用之
(3) 反間者
11. 因其敵間而用之
(4) 死間者
12. 為誑事于外
令吾聞知之
而傳于敵間也
(5) 生間者
反報也

Mind Map 68: Aow Ch. XIII, Chinese Mind Map - Part 1

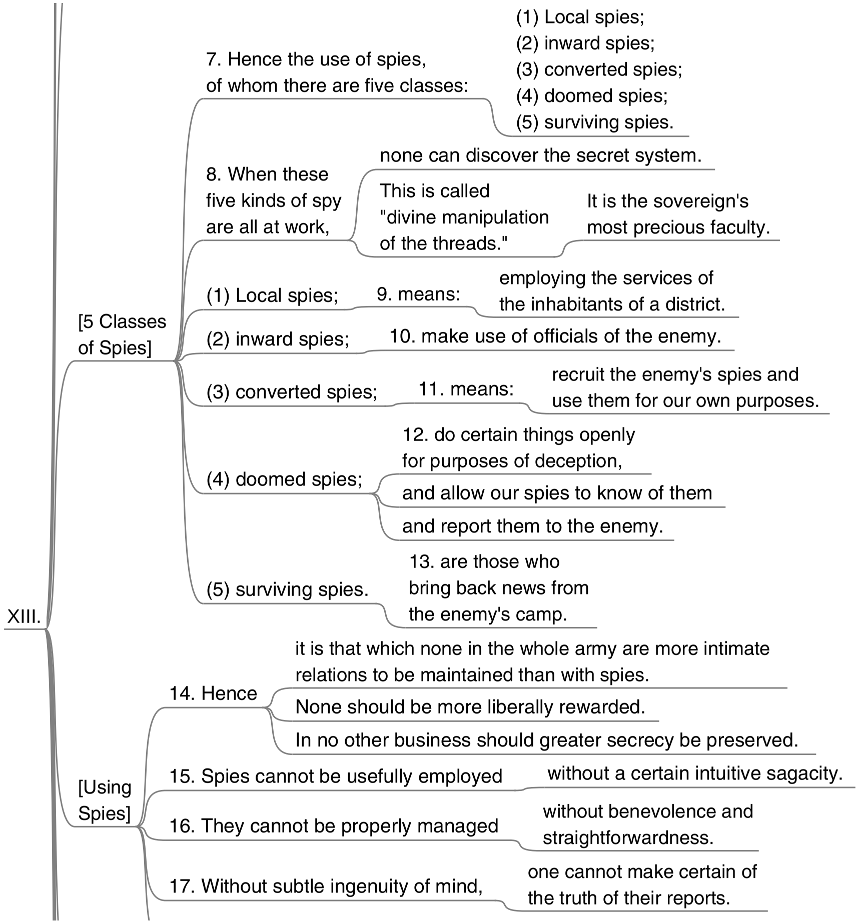

用間第十三
[用間]
14. 故
三軍之事
莫親于間
賞
莫厚于間
事
莫密于間
15. 非聖智
不能用間
16. 非仁義
不能使間
17. 非微妙
不能得間之實
18. 微哉！微哉！
無所不用間也
[死]
19. 間事未發，而先聞者
間與所告者兼死
[知之]
20. 凡
軍之所欲擊
城之所欲攻
人之所欲殺
必先知其
守將
左右
謁者
門者
舍人之姓名
令吾間必索知之
[反間]
21. 必索敵人之間來間我者
因而利之
導而舍之
故反間可得而用也
22. 因是而知之
故鄉間、內間可得而使也
23. 因是而知之
故死間為誑事可使告敵
24. 因是而知之
故生間可使如期
25. 五間之事，君必知之
知之必在于反間
故反間不可不厚也
[明君賢將]
26. 昔殷之興也，伊摯在夏
周之興也，呂牙在殷
27. 故惟明君賢將能以上智為間者
必成大功
此兵之要，三軍之所恃而動也

Mind Map 69: Aow Ch. XIII, Chinese Mind Map - Part 2

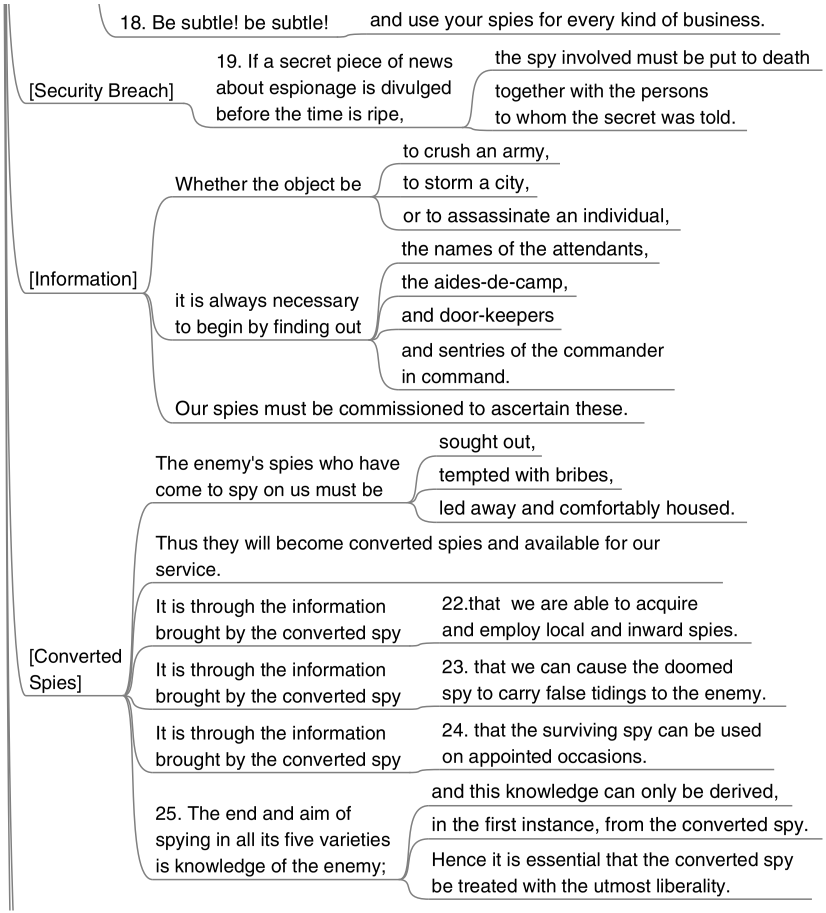


- Sun Tzu said:
- [the Reason to Use Spies]
  - 1. Raising a host of a hundred thousand men and marching them great distances
    - [Expenditure]
      - entails heavy loss on the people
      - and a drain on the resources of the State.
      - The daily expenditure will amount to a thousand ounces of silver.
    - [Commotion]
      - There will be commotion at home and abroad,
      - and men will drop down exhausted on the highways.
      - As many as seven hundred thousand families will be impeded in their labor.
  - [Inhumanity]
    - 2. Hostile armies may face each other for years,
      - striving for the victory which is decided in a single day.
    - This being so, to remain in ignorance of the enemy's condition
      - simply because one grudges the outlay of a hundred ounces of silver in honors and emoluments,
      - is the height of inhumanity.
        - 3. he is no leader of men,
        - no present help to his sovereign,
        - no master of victory.
  - 4. Thus, what enables the wise sovereign and the good commander
    - to strike and conquer,
    - and achieve things beyond the reach of ordinary men,
    - is foreknowledge.
- [Foreknowledge]
  - 5. this foreknowledge
    - cannot be elicited from spirits;
    - it cannot be obtained inductively from experience,
    - nor by any deductive calculation.
    - 6. Knowledge of the enemy's dispositions can only be obtained from other men.

Mind Map 70: Aow Ch. XIII, English Mind Map - Part 1

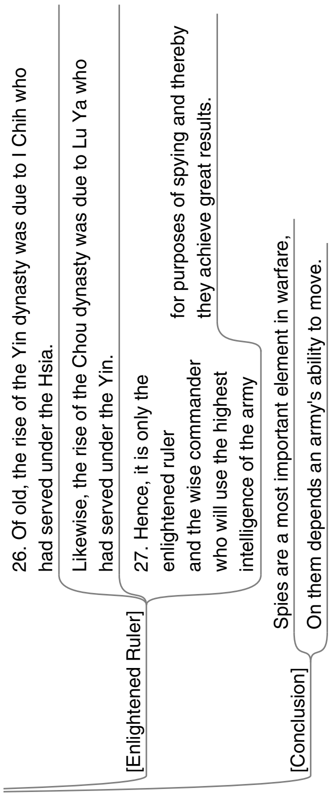

XIII.
[5 Classes of Spies]
7. Hence the use of spies, of whom there are five classes:
(1) Local spies;
(2) inward spies;
(3) converted spies;
(4) doomed spies;
(5) surviving spies.
8. When these five kinds of spy are all at work,
none can discover the secret system.
This is called "divine manipulation of the threads."
It is the sovereign's most precious faculty.
(1) Local spies;
9. means:
employing the services of the inhabitants of a district.
(2) inward spies;
10. make use of officials of the enemy.
(3) converted spies;
11. means:
recruit the enemy's spies and use them for our own purposes.
(4) doomed spies;
12. do certain things openly for purposes of deception,
and allow our spies to know of them
and report them to the enemy.
(5) surviving spies.
13. are those who bring back news from the enemy's camp.
[Using Spies]
14. Hence
it is that which none in the whole army are more intimate relations to be maintained than with spies.
None should be more liberally rewarded.
In no other business should greater secrecy be preserved.
15. Spies cannot be usefully employed
without a certain intuitive sagacity.
16. They cannot be properly managed
without benevolence and straightforwardness.
17. Without subtle ingenuity of mind,
one cannot make certain of the truth of their reports.

Mind Map 71: Aow Ch. XIII, English Mind Map - Part 2



- 18. Be subtle! be subtle!
  - and use your spies for every kind of business.
- [Security Breach]
  - 19. If a secret piece of news about espionage is divulged before the time is ripe,
    - the spy involved must be put to death
    - together with the persons to whom the secret was told.
- [Information]
  - Whether the object be
    - to crush an army,
    - to storm a city,
    - or to assassinate an individual,
  - it is always necessary to begin by finding out
    - the names of the attendants,
    - the aides-de-camp,
    - and door-keepers
    - and sentries of the commander in command.
  - Our spies must be commissioned to ascertain these.
- [Converted Spies]
  - The enemy's spies who have come to spy on us must be
    - sought out,
    - tempted with bribes,
    - led away and comfortably housed.
  - Thus they will become converted spies and available for our service.
  - It is through the information brought by the converted spy
    - 22.that we are able to acquire and employ local and inward spies.
  - It is through the information brought by the converted spy
    - 23. that we can cause the doomed spy to carry false tidings to the enemy.
  - It is through the information brought by the converted spy
    - 24. that the surviving spy can be used on appointed occasions.
  - 25. The end and aim of spying in all its five varieties is knowledge of the enemy;
    - and this knowledge can only be derived,
    - in the first instance, from the converted spy.
    - Hence it is essential that the converted spy be treated with the utmost liberality.

Mind Map 72: Aow Ch. XIII, English Mind Map - Part 3



26. Of old, the rise of the Yin dynasty was due to I Chih who had served under the Hsia.

Likewise, the rise of the Chou dynasty was due to Lu Ya who had served under the Yin.

27. Hence, it is only the enlightened ruler and the wise commander who will use the highest intelligence of the army

for purposes of spying and thereby they achieve great results.

Spies are a most important element in warfare,

On them depends an army's ability to move.

Mind Map 73: Aow Ch. XIII, English Mind Map - Part 4

Details and Patterns

This chapter is not only the last chapter in Sun Tzu's book the AoW, it seems also to be the last one written, see Mair's book [46, p. 29]. Its subject, spies, is not talked about in the other chapters, nevertheless Sun Tzu deems it to be of utmost importance

Sun Tzu Said:

In this last chapter of Sun Tzu's **The Art of War** we could not find any *pair of opposites*, or *metaphor patterns.* There is an abundance of reasoning though, that we have tried to classify into various conditional sentence patterns.

An essential pattern is the *enumeration* specifying the 5 types of spies. Most of the chapter is used to explain for each type why this type os spy is useful and how each type should be managed.

The Reason to Use Spies

The key to the reason to use spies is Sun Tzu's conviction that to *not* use them would be inhumane. He argues that raising an army is very expensive, both in expence and human resources. Therefore, it would be inhumane to be ignorant of the enemy's condition. The only way to find out, is to use spies. The mind map overvie fragment for this section can be found in 155.

- **Conditional Sentences** in *The Reason to Use Spies*, see figure 155
  - Par. 1: `Raising a host of a hundred thousand men…`
    `Cond. => 6 Conseq.` .
  - Par. 2: `Hostile armies may face each other for years…`
    `4 Cond. => Judge.` ;
  - Par. 3: `he is no leader of men…`
    `Cond. => 3 Conseq.` ;
  - Par. 4: `Thus, what enables the wise sovereign…`
    `=> Judge. (故)` ;

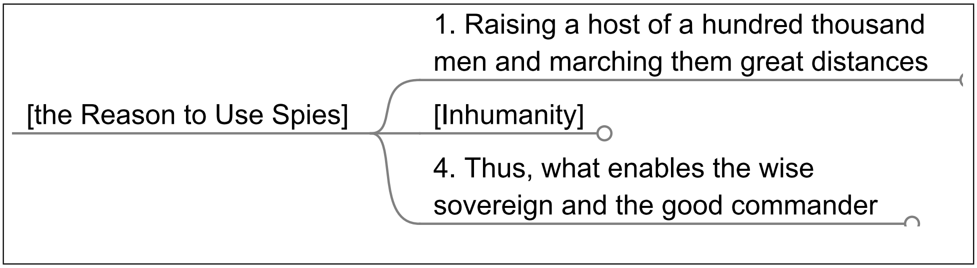

[the Reason to Use Spies]
1. Raising a host of a hundred thousand men and marching them great distances
[Inhumanity]
4. Thus, what enables the wise sovereign and the good commander

Fig. 155: The Reason to Use Spies, Overview

The details for the mind map in figure 155 can be found in figure 156, figure 157, and figure 158.

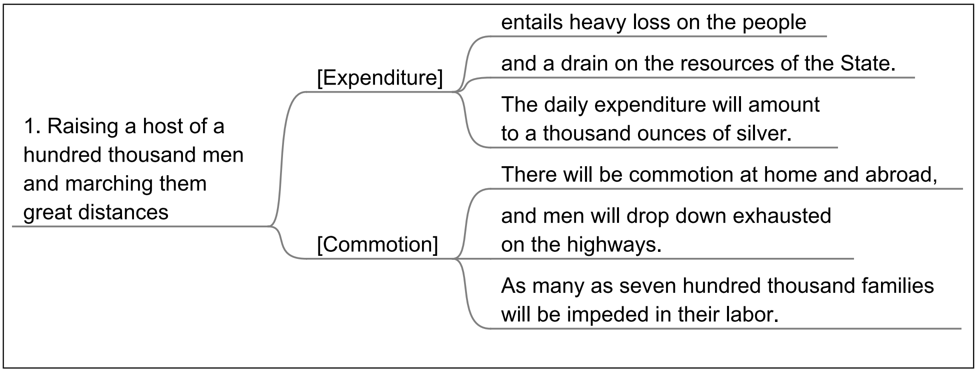

1. Raising a host of a hundred thousand men and marching them great distances
[Expenditure]
entails heavy loss on the people
and a drain on the resources of the State.
The daily expenditure will amount to a thousand ounces of silver.
[Commotion]
There will be commotion at home and abroad,
and men will drop down exhausted on the highways.
As many as seven hundred thousand families will be impeded in their labor.

Fig. 156: The Reason to Use Spies, detail: Raising a large army

In figure 156 we see the argumentation about raising a large army.

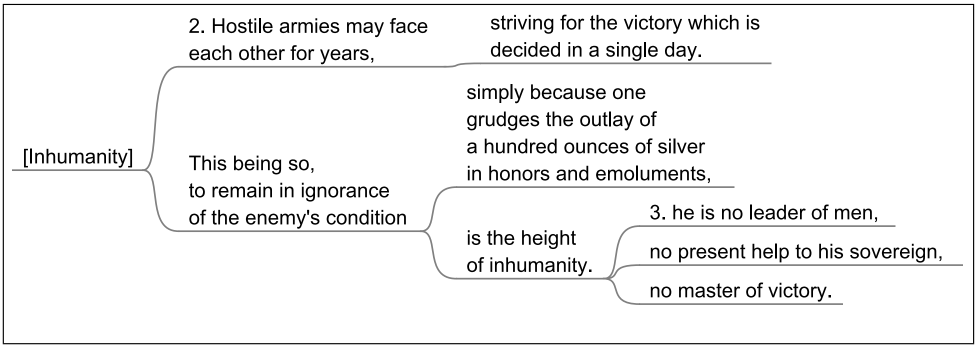

[Inhumanity]
2. Hostile armies may face each other for years,
striving for the victory which is decided in a single day.
This being so, to remain in ignorance of the enemy's condition
simply because one grudges the outlay of a hundred ounces of silver in honors and emoluments,
is the height of inhumanity.
3. he is no leader of men,
no present help to his sovereign,
no master of victory.

Fig. 157: The Reason to Use Spies, detail: Inhumanity

In figure 157 the conclusion is drawn that staying ignorant of the enemy's condition would be inhumane.

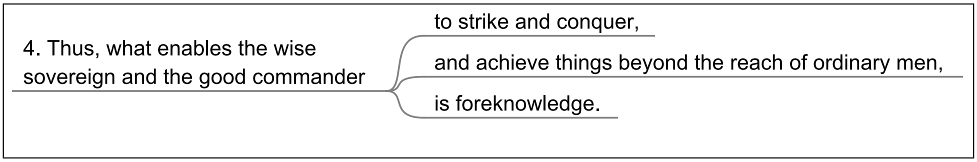
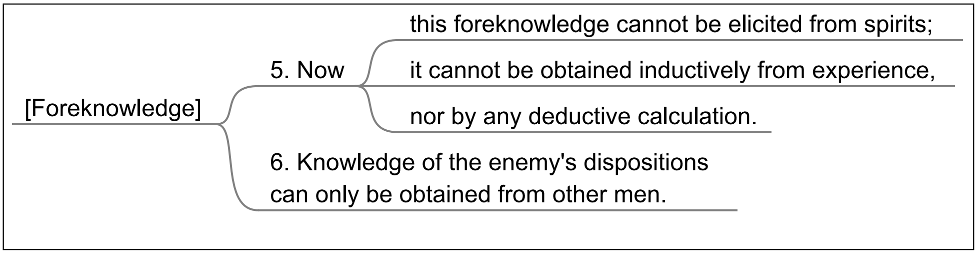

4. Thus, what enables the wise sovereign and the good commander
to strike and conquer,
and achieve things beyond the reach of ordinary men,
is foreknowledge.

Fig. 158: The Reason to Use Spies, detail: Good Commander

In figure 158 it is concluded that a good commander needs foreknowledge.

Foreknowledge

There a many ways foreknowledge cannot be obtained, see figure 159.



[Foreknowledge]

5. Now

this foreknowledge cannot be elicited from spirits;

it cannot be obtained inductively from experience,

nor by any deductive calculation.

6. Knowledge of the enemy's dispositions can only be obtained from other men.

Fig. 159: Foreknowledge

5 Classes of Spies

After having concluded that foreknowledge can only be obtained from other men, or spies, Sun Tzu explains what type of spies there are and how they work.

Sun Tzu considers the use of spies of vital importance, and he *enumerates* 5 types: (1) Local spies; (2) inward spies; (3) converted spies; (4) doomed spies; (5) surviving spies.

- **Conditional Sentences** in *5 Classes of Spies*, see figure 160
  - Par. 7:
    `Hence the use of spies, of whom there are five classes…`
    `=> Conseq. (故)` ; the consequence is an enumeration.
  - Par. 8: `When these five kinds of spy are all at work…`
    `Judge.` ;
- **Definitions**
  - Par. 9-13: See figure 160
    `5 Def.` (a person involved in…) is used as bound variable;

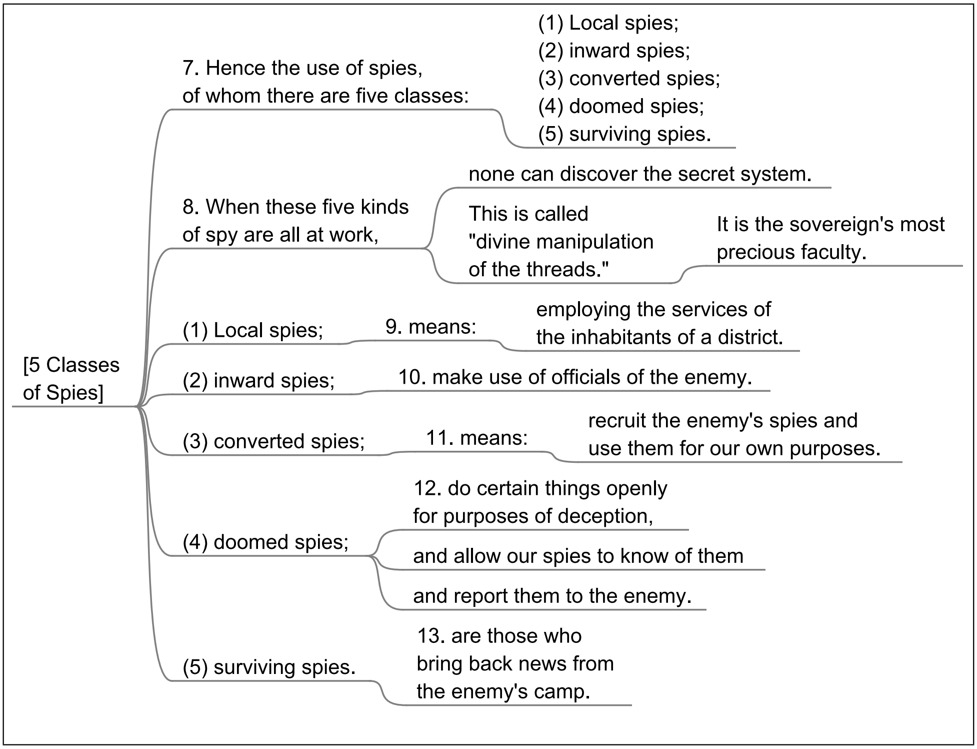

[5 Classes of Spies]
7. Hence the use of spies, of whom there are five classes:
(1) Local spies;
(2) inward spies;
(3) converted spies;
(4) doomed spies;
(5) surviving spies.
8. When these five kinds of spy are all at work,
none can discover the secret system.
This is called "divine manipulation of the threads."
It is the sovereign's most precious faculty.
(1) Local spies;
9. means:
employing the services of the inhabitants of a district.
(2) inward spies;
10. make use of officials of the enemy.
(3) converted spies;
11. means:
recruit the enemy's spies and use them for our own purposes.
(4) doomed spies;
12. do certain things openly for purposes of deception,
and allow our spies to know of them
and report them to the enemy.
(5) surviving spies.
13. are those who bring back news from the enemy's camp.

Fig. 160: 5 Classes of Spies

Using Spies

After having defined what types of spies there are and what they do, the next question is how they can be used. This is explained in the mind map detail in figure 161.

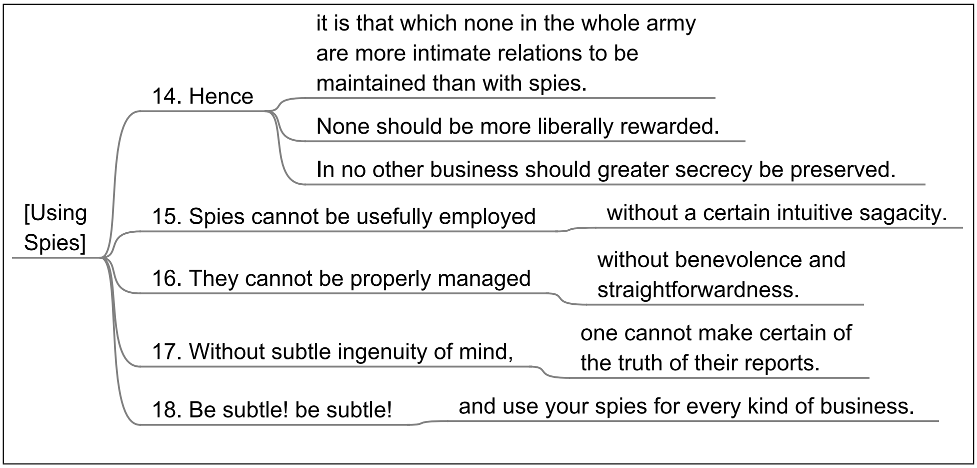

[Using Spies]
14. Hence
it is that which none in the whole army are more intimate relations to be maintained than with spies.
None should be more liberally rewarded.
In no other business should greater secrecy be preserved.
15. Spies cannot be usefully employed
without a certain intuitive sagacity.
16. They cannot be properly managed
without benevolence and straightforwardness.
17. Without subtle ingenuity of mind,
one cannot make certain of the truth of their reports.
18. Be subtle! be subtle!
and use your spies for every kind of business.

Fig. 161: Using Spies

- **Conditional Sentences** in *Using Spies*, see figure 161
  - Par. 14:
    `Hence it is that which none in the whole army are more intimate relations…`
    `=> 3 Adv. (故)`
  - Par. 15-17: `Spies cannot be usefully employed…`
    `(Conseq. <= Cond.) , Cond. => Conseq.` .
  - Par. 18: `Be subtle! be subtle!…`
    `Adv.` .

Security Breach

There are ruthless rules if information is not kept secret, see figure 162.

- **Conditional Sentences** in *Security Breach*, see figure 162
  - Par. 19:
    `If a secret piece of news about espionage is divulged…`
    `Cond. => 2 Conseq.`

According to David Jones [32, p. 28], this is the one and only violence authorization in Art of War.

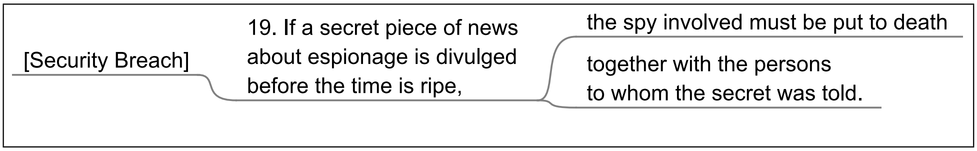

[Security Breach]
19. If a secret piece of news about espionage is divulged before the time is ripe,
the spy involved must be put to death
together with the persons to whom the secret was told.

Fig. 162: Security Breach

Information

This section talks about what information is needed, see figure 163.

- **Conditional Sentences** in *Information*, see figure 163
  - Par. 20: `Whether the object be to crush an army,…`
    `3 Cond. => 4 Conseq, Adv.`

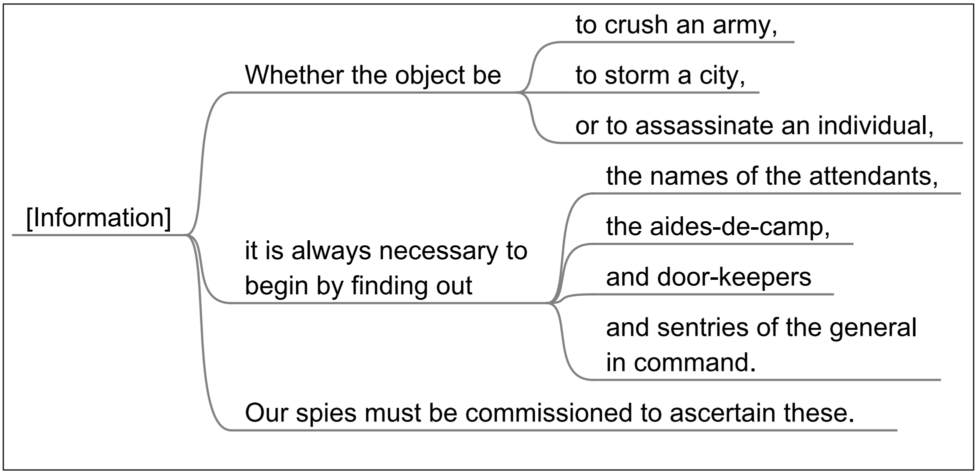

[Information]
Whether the object be
to crush an army,
to storm a city,
or to assassinate an individual,
it is always necessary to begin by finding out
the names of the attendants,
the aides-de-camp,
and door-keepers
and sentries of the general in command.
Our spies must be commissioned to ascertain these.

Fig. 163: Information

Converted Spies

The *converted spy* seems to be the most important type of spy, to be treated with care.

The set of paragraphs, par. 22-24, in this section show a repetitive pattern, where the same Chinese text:

因是而知之

is used in each paragraph. The original Giles translation is different at each occurrence. We restored the translation to have the same text at all three places:

```
It is through the information brought
by the converted spy
```

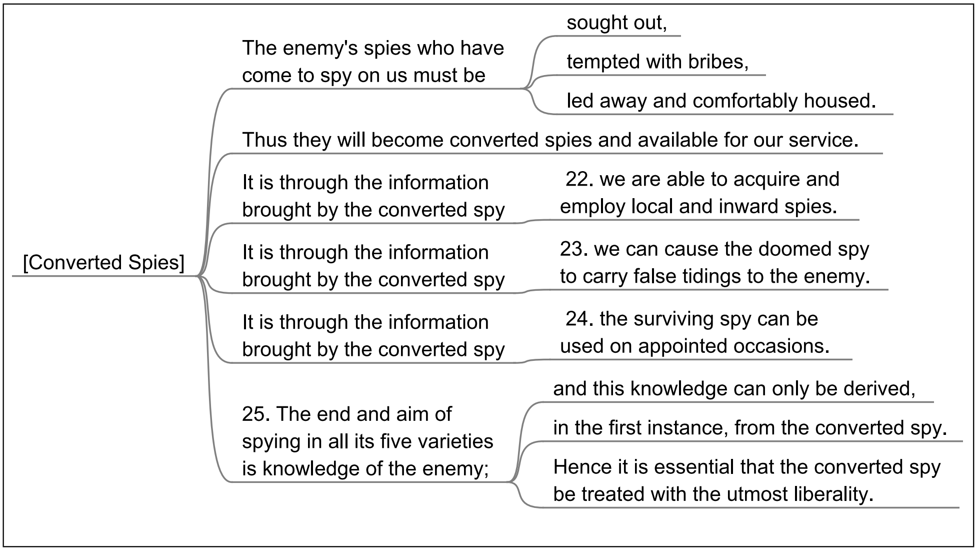

[Converted Spies]
The enemy's spies who have come to spy on us must be
sought out,
tempted with bribes,
led away and comfortably housed.
Thus they will become converted spies and available for our service.
It is through the information brought by the converted spy
22. we are able to acquire and employ local and inward spies.
It is through the information brought by the converted spy
23. we can cause the doomed spy to carry false tidings to the enemy.
It is through the information brought by the converted spy
24. the surviving spy can be used on appointed occasions.
25. The end and aim of spying in all its five varieties is knowledge of the enemy;
and this knowledge can only be derived,
in the first instance, from the converted spy.
Hence it is essential that the converted spy be treated with the utmost liberality.

Fig. 164: Converted Spies

The formalized conditional sentences look like this:

- **Conditional Sentences** in *Converted Spies*, see figure 164
  - Par. 21: `The enemy's spies who have come to spy on us…`
    `3 Adv. => Judge. (故)`;
  - Par. 22-24:
    `It is through the information brought by the converted spy…`
    `3 (Cond. => Conseq). (故)`;

Enlightened Ruler

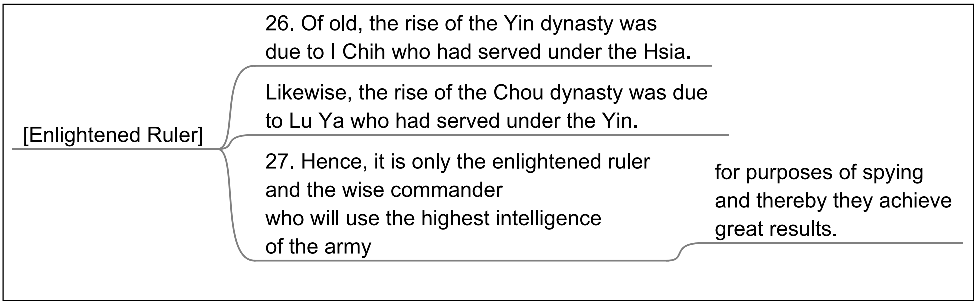

[Enlightened Ruler]
26. Of old, the rise of the Yin dynasty was due to I Chih who had served under the Hsia.
Likewise, the rise of the Chou dynasty was due to Lu Ya who had served under the Yin.
27. Hence, it is only the enlightened ruler and the wise commander who will use the highest intelligence of the army
for purposes of spying and thereby they achieve great results.

Fig. 165: Enlightened Ruler

Conclusion

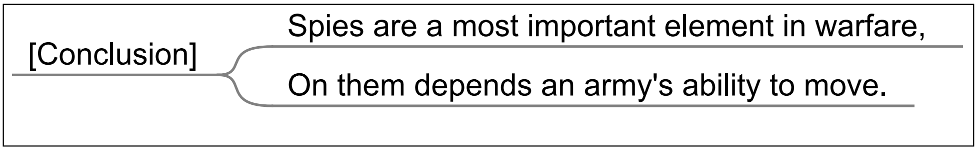

[Conclusion]
Spies are a most important element in warfare,
On them depends an army's ability to move.

Fig. 166: Conclusion

- **Conditional Sentence** in *Conclusion*, see figure 166
  - Par. 27: `Hence, it is only the enlightened ruler…`
    `2 Conseq., 2 Judge. (故)` ;

The AoW ends with the conclusion that *Spies are a most important element in warfare.* It is an awkward conclusion for the whole book, therefore it is indeed likely that this chapter, AoW Ch.XIII, was added later.

Kindhearted people might of course think there was some ingenious way to disarm or defeat an enemy without too much bloodshed, and might imagine this is the true goal of The Art of War. Pleasant as it sounds, it is a fallacy that must be exposed. [1]

---

[1] Jones, David G. The School of Sun Tzu: Winning Empires Without War (p. 249). iUniverse [32], quoting: Handel, Michael I. Masters of War: Sun Tzu, Clausewitz, and Jomini. London: Frank Cass and Co., 1992.

Structured Text

XIII. THE USE OF SPIES

- **Sun Tzu Said:**

- **the Reason to Use Spies**

  1. Raising a host of a hundred thousand men and marching them great distances
     - » [Expenditure]
       - ° entails heavy loss on the people
       - ° and a drain on the resources of the State.
       - ° The daily expenditure will amount to a thousand ounces of silver.
     - » [Commotion]
       - ° There will be commotion at home and abroad,
       - ° and men will drop down exhausted on the highways.
       - ° As many as seven hundred thousand families will be impeded in their labor.

  [Inhumanity]
     - » 2. Hostile armies may face each other for years,
       - ° striving for the victory which is decided in a single day.
     - » This being so, to remain in ignorance of the enemy's condition
       - ° simply because one grudges the outlay of a hundred ounces of silver in honors and emoluments,
       - ° is the height of inhumanity.
         - 3. he is no leader of men,
         - no present help to his sovereign,
         - no master of victory.

  4. Thus, what enables the wise sovereign and the good commander
     - » to strike and conquer,
     - » and achieve things beyond the reach of ordinary men,
     - » is foreknowledge.

- **Foreknowledge**

  5. this foreknowledge
     - » cannot be elicited from spirits;
     - » it cannot be obtained inductively from experience,
     - » nor by any deductive calculation.
     - » 6. Knowledge of the enemy's dispositions can only be obtained from other men.

- **5 Classes of Spies**

  7. Hence the use of spies, of whom there are five classes:
     - » (1) Local spies; (2) inward spies; (3) converted spies; (4) doomed spies; (5) surviving spies.

```
8. When these five kinds of spy are all at work,
  » none can discover the secret system.
  » This is called 'divine manipulation of the
    threads.'
    ° It is the sovereign's most precious faculty.
(1) Local spies;
  » 9. means employing the services of the inhabitants
    of a district.
(2) inward spies;
  » 10. make use of officials of the enemy.
(3) converted spies;
  » 11. means:
    ° recruit the enemy's spies and use them for our
      own purposes.
(4) doomed spies;
  » 12. do certain things openly for purposes of
    deception,
  » and allow our spies to know of them
  » and report them to the enemy.
(5) surviving spies.
  » 13. are those who bring back news from the enemy's
    camp.
```

- **Using Spies**

```
14. Hence
  » it is that which none in the whole army are more
    intimate relations to be maintained than with spies.
  » None should be more liberally rewarded.
  » In no other business should greater secrecy be
    preserved.
15. Spies cannot be usefully employed
  » without a certain intuitive sagacity.
16. They cannot be properly managed
  » without benevolence and straightforwardness.
17. Without subtle ingenuity of mind,
  » one cannot make certain of the truth of their
    reports.
18. Be subtle! be subtle!
  » and use your spies for every kind of business.
```

- **Security Breach**

```
19. If a secret piece of news about espionage is
divulged before the time is ripe,
  » the spy involved must be put to death
  » together with the persons to whom the secret was
    told.
```

- **Information**

```
Whether the object be
  » to crush an army,
  » to storm a city,
  » or to assassinate an individual,
it is always necessary to begin by finding out
  » the names of the attendants,
```

  » the aides-de-camp,
  » and door-keepers
  » and sentries of the commander in command.
Our spies must be commissioned to ascertain these.

- **Converted Spies**

The enemy's spies who have come to spy on us must be
  » sought out,
  » tempted with bribes,
  » led away and comfortably housed.
Thus they will become converted spies and available for our service.
It is through the information brought by the converted spy
  » 22.that we are able to acquire and employ local and inward spies.
It is through the information brought by the converted spy
  » 23. that we can cause the doomed spy to carry false tidings to the enemy.
It is through the information brought by the converted spy
  » 24. that the surviving spy can be used on appointed occasions.
25. The end and aim of spying in all its five varieties is knowledge of the enemy;
  » and this knowledge can only be derived,
  » in the first instance, from the converted spy.
  » Hence it is essential that the converted spy be treated with the utmost liberality.

- **Enlightened Ruler**

26. Of old, the rise of the Yin dynasty was due to I Chih who had served under the Hsia.
Likewise, the rise of the Chou dynasty was due to Lu Ya who had served under the Yin.
27. Hence, it is only the enlightened ruler and the wise commander who will use the highest intelligence of the army
  » for purposes of spying and thereby they achieve great results.

- **Conclusion**

Spies are a most important element in warfare,
On them depends an army's ability to move.

Part III

Pattern Reference

This part contains a list of all patterns found, with references to where they were found.

Forging a Brotherhood in the Peach Garden

List of All Patterns

Abstract This chapter shows an overview of the patterns we found in "The Art of War".

Introduction

This chapter lists the patterns found in each chapter of "The Art of War", by pattern type, as a reference. A more detailed description of each occurrence of a pattern, is given in the chapter where the pattern was found. **Note:** numbers in front of item descriptions refer to paragraph numbers in the AoW chapters, shown as: Par. nr.

For descriptions, definitions and explanations about the patterns: see: Patterns, on page 51.

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P. van Emde Boas et al., *Analyzing the Logic of Sun Tzu in "The Art of War", Using Mind Maps*, Logic in Asia: Studia Logica Library,
https://doi.org/10.1007/978-981-19-6250-9_25

Enumerations

For detailed description of the *Enumerations* pattern, see: Enumerations, on page 51. The enumerations we found are:

Chapter I

- Par. 4: **Constant Factors**, see: Constant Factors, on page 111.
  (1) The Moral Law; (2) Heaven; (3) Earth; (4) The Commander; (5) Method and discipline.
- Par. 13: **Deliberations**, see: Deliberations, on page 113.
  (1) Moral law? (2) most ability? (3) Heaven and Earth? (4) discipline? (5) Which army is stronger? (6) more highly trained? (7) constancy both in reward and punishment?

Chapter III

- Par. 12: **Misfortune**, see: Guardian, on page 151.
  There are three ways in which a ruler can bring misfortune: (1) By commanding the army in a way that it cannot obey. (2) By attempting to govern an army in the same way as he administers a kingdom. (3) By employing the officers of his army without discrimination.
- Par. 17: **Essentials for Victory**. see: Essentials for Victory, on page 152. Five essentials for victory: (1) Knows when to fight and when not to fight. (2) Knows how to handle both superior and inferior forces. (3) Whose army is animated by the same spirit throughout all its ranks. (4) Who, prepared himself, waits to take the enemy unprepared. (5) Who has military capacity and is not interfered with by the sovereign.

Chapter IV

- Par. 16: **Military Method**. see: Military Method, on page 165.
  1: Measurement; 2: Estimation of quantity; 3: Calculation; 4: Balancing of chances; 5: Victory

Chapter V

- Par. 10: **Methods of attack in battle**, see: From Five to Infinity, on page 178.
  The direct and the indirect;

Chapter VI

- Par. 34: **five elements**,
  water, fire, wood, metal, earth
- Par. 34: **four seasons**, see: The Way in War, on page 201.
  the four seasons make way for each other in turn.

Chapter VIII

- Par. 2: **5 types of country**, see: Variations, on page 237.
  difficult country, where high roads intersect, dangerously isolated positions, hemmed-in situations, desperate position,
- Par. 3: **5 do nots**, see: Variations, on page 237.
  roads which must not be followed, armies which must be not attacked, towns which must not be besieged, positions which must not be contested, commands of the sovereign which must not be obeyed.
- Par. 12: **5 Faults of a Commander**, see: Five Dangerous Faults, on page 238.
  Recklessness, cowardice, a hasty temper, a delicacy of honor, over-solicitude for his men.

Chapter IX

- Par. 2-10: **4 Useful branches of Military Knowledge**, see: Four Useful Branches of Military Knowledge, on page 255.
  Mountain Warfare, River Warfare, Warfare in Salt-Marshes, Warfare in Flat Country.

Chapter X

- Par. 1: **6 Kinds of Terrain**, see: Terrain, on page 279.
  (1) Accessible ground; (2) entangling ground; (3) deadlocked ground; (4) narrow ground; (5) precipitous ground; (6) distant ground.
- Par. 14: **Calamities**, see: Calamities, on page 281.
  (1) Flight; (2) insubordination; (3) collapse; (4) ruin; (5) disorganization; (6) disorderly retreat.

Chapter XI

- Par. 1: **9 Varieties of Ground**, see: Nine Varieties of Ground, on page 301.
  (1) Dispersive ground; (2) light ground; (3) contentious ground; (4) wide ground; (5) intersecting grounds; (6) heavy ground; (7) wasteland; (8) encircled ground; (9) desperate ground.

Chapter XII

- Par. 1: **5 Ways of Attacking with Fire**, see: Attack with Fire, on page 338.
  The first is to burn soldiers in their camp; the second is to burn stores; the third is to burn baggage trains; the fourth is to burn arsenals and magazines; the fifth is to hurl dropping fire amongst the enemy.

Chapter XIII

- Par. 7: **5 Types of Spies**, see: 5 Classes of Spies, on page 358.
  (1) Local spies; (2) inward spies; (3) converted spies; (4) doomed spies; (5) surviving spies.

Pairs of Opposites

A detailed description of the *Pairs of Opposites* pattern can be found in see: Pairs of Opposites, on page 53.

Chapter I

- Par. 1: **life and death**, see: Sun Tzu Said:, on page 111.
- Par. 2: **night and day, cold and heat, times and seasons**, see: Constant Factors, on page 111.
- Par. 3: **great and small; danger and security; open ground and narrow passes**, see: Constant Factors, on page 111.
- Par. 19-24: In the subject **deception**, there is a series of pairs of opposites:
  - **able, unable**
  - **using forces, seem inactive**
  - **near, far away**
  - **arrogant, weak**
  - **take ease, no rest**
  - **united, separated**

  see: Deception, on page 113.

Chapter II

- Par. 20: **Peace or peril**, see: Result, on page 133.

Chapter III

- Par. 1: **capture intact, destroy**, see: Art of War, on page 147.

Chapter IV

- Par. 7: *secret recesses of the earth*, *heights of heaven*, see: Defensive and Offensive, on page 162.

Chapter V

- Par. 3: **Weak and Strong**, see: Weak and Strong, on page 176.
- Par. 5: **direct and indirect**, see: Direct and Indirect, on page 177.

- Par. 6: **Heaven and Earth, Rivers and Streams, Sun and Moon**. see: Direct and Indirect, on page 177.
- Par. 17: **Order and disorder, fear and courage, strength and weakness**; see: Order and Disorder, on page 180.

Chapter VI

- Par. Chapter title: **Weak Points and Strong**; see: Details and Patterns, on page 196.
- Par. 4: **At Ease and Harass**; see: Time of Attack, on page 196.
- Par. 4: **supplied with food, or starve**; see: Time of Attack, on page 196.
- Par. 4: **Encamp and Move**; see: Time of Attack, on page 196.
- Par. 7-8: **Attack and Defend**; see: Success of Attack, on page 197.
- Par. 10: **Advance and Retire**; see: Success of Attack, on page 197.
- Par. 13: **Concentrate and Divide**; see: Fighting, on page 198.
- Par. 14: **Whole and Separate Parts**; see: Fighting, on page 198.
- Par. 17: **Front and Rear, Left and Right, Reinforce and Weaken**; see: Place of Attack, on page 199.
- Par. 30: **Avoid Strong and Strike Weak**; see: The Way in War, on page 201.

Chapter VII

- Par. 3: **Devious or Direct, Misfortune and Gain**. See see: Maneuvering, on page 219.
- Par. 16: **Concentrate or divide**. see: Maneuvering, on page 219.
- Par. 25: **The brave or the cowardly**. see: Circumstances, on page 223.
- Par. 29: **Keen or sluggish**. see: Circumstances, on page 223.
- Par. 31: **Near** the goal, or **far** from it, **at ease** or **toiling and struggling**, **well-fed or famished**. see: Circumstances, on page 223.
- Par. 33: **uphill, or downhill**. see: Circumstances, on page 223.

Chapter VIII

- Par. 4-5: The commander who **understands**, or who **does not understand**. see: Variations, on page 237.
- Par. 7: Considerations of **advantage** and of **disadvantage**. see: Variations, on page 237.

Chapter IX

- Par. 1: **mountains** and **valleys**. see: Four Useful Branches of Military Knowledge, on page 255.

- Par. 9: **danger** and **safety**, **front** and **rear**. see: Four Useful Branches of Military Knowledge, on page 255.
- Par. 11: **high ground and low, sunny places or dark**. see: Preferences, on page 258.
- Par. 16: Keep **away** and **approach**; **face** and **rear**. see: Terrain Type, on page 258.
- Par. 23: **High and low**. see: Circumstances, on page 259.
- Par. 24: **humble words and violent language**. see: Enemy Behavior, on page 261.
- Par. 28: **advancing and retreating**. see: Enemy Behavior, on page 261.
- Par. 43: **Humanity, and iron discipline**. see: Commanding, on page 263.

Chapter X

- Par. 4-5: **unprepared, or prepared**. see: Terrain, on page 279.
- Par. 16: **soldiers strong and officers weak** or **officers strong and soldiers weak**. see: Calamities, on page 281.
- Par. 19: **inferior force against a larger one**. see: Calamities, on page 281.
- Par. 22: **Knowing and winning**. **not knowing and defeat**. see: Good Commander, on page 284.
- Par. 24: **without coveting fame or fearing disgrace**. see: Good Commander, on page 284.

Chapter XI

- Par. 15: Skillful leaders knowledge:
  - **Front and Rear**;
  - **Large and Small** divisions;
  - **Good and Bad**;
  - **Officers and Men**.

  see: Skillful Leaders, on page 301
- Par. 17: **Forward Move or Stopped Still**. see: Skillful Leaders, on page 301
- Par. 29: **Head and Tail**, see: Skillful Commander, on page 320.
- Par. 33: **strong and weak**. see: Skillful Commander, on page 320.
- Par. 41: **Aggressive or Defensive tactics**; see: Business of a Commander, on page 320.
- Par. 42: **Cohesion and Dispersion**. see: Hostile Territory, on page 321.
- Par. 44: **Heavy ground and Light ground**. see: Hostile Territory, on page 321.
- Par. 57: **bright or gloomy**. see: Communication with your Army, on page 324.
- Par. 68: **Coyness of a maiden, Rapidity of a running hare**. see: Success in Warfare, on page 325.

Chapter XII

- Par. 13: **Fire and Water**. see: Enlightened Ruler, on page 340.
- Par. 19: **Move and Stay**. see: Commanding, on page 341.
- Par. 21: **Destroyed and Being; Death and Life**. see: Keeping Peace, on page 341.

Definitions

A description of the *Definition* pattern can be found in see: Definitions, on page 55.

Chapter I

- Par. 5-10: see: Constant Factors, on page 111

Chapter X

- Par. 2-6: see: Terrain, on page 279

Chapter XI-1

- Par. 2-10: see: Nine Varieties of Ground, on page 301

Chapter XI-2

- Par. 42-45: see: Hostile Territory, on page 321

Chapter XIII

- Par. 9-13: see: 5 Classes of Spies, on page 358

Preference Order

A description of the *Preference Order* pattern can be found in see: Preference Order, on page 56.

Chapter I

- Par. 26: see: Calculations, on page 114

Chapter III

- Par. 1: see: Art of War, on page 147
- Par. 3: see: Leadership, on page 148

Metaphors

A metaphor is a concept or thing regarded as representative or symbolic of something else. A detailed description of the *Metaphors* pattern can be found in: Metaphors, on page 55.

Chapter I

- Par. 3: **Heaven and Earth**. see: Constant Factors, on page 111.

Chapter III

- Par. 5: **Swarming Ants**, see: Leadership, on page 148.

Chapter IV

- Par. 7: **Secret Recesses**. see: Defensive and Offensive, on page 162.
- Par. 10: **Lift Autumn Hair, see moon and sun, to hear the noise of thunder**. see: Excellent Victory, on page 163.
- **A Pound's Weight**. see: Military Method, on page 165.

Chapter V

- Par. 4: **Grindstone**. see: Weak and Strong, on page 176.
- Par. 6: **Heaven and Earth, Flow of Rivers and Streams, Sun and Moon, Four Seasons**. see: Direct and Indirect, on page 177.
- Par. 12-15: **the Rush of a Torrent, well-timed Swoop of a Falcon, the Bending of a Crossbow, the Releasing of a Trigger**. see: Circumstance, on page 180.
- Par. 22-23: **Rolling Logs or Stones, Round Stone Rolled down a Mountain**. see: Momentum, on page 182.

Chapter VI

- Par. 29. **Military tactics are like water**; see: The Way in War, on page 201.
- Par. 34: **Five Elements, Four Seasons, Length of Day, Lunar Phases**. see: The Way in War, on page 201.

Chapter VII

- Par. 17-19: **Wind, Fire, Mountain, Night, Thunderbolt**. see: Maneuvering, on page 222.

Chapter XI

- Par. 38: **Kick a Ladder**. see: Business of a Commander, on page 320.
- Par. 68: **Coyness of a Maiden, Rapidity of a Running Hare**. see: Success in Warfare, on page 325.

Conditional Sentences

A quick reminder: the important characters for finding conditional sentences are: 故 (gu) or 是故 (shi gu), 也 (ye), 则 (zé), 者 (zhě), 凡 (fán).

The clauses forming the antecedent or Consequence are divided in four categories:

1. Situations or conditions, describing a state of affairs; `Cond` .
2. Consequences, describing a change in the state of affairs as a Consequence of a condition; `Conseq.` .
3. Advice given by Sun Tzu, usually following a description of conditions and Consequences. `Adv.` .
4. The fourth category, called judgements, includes both value judgements by the author (in this case Sun Tzu), or sometimes conclusions. `Judge.` .

Chapter I

- Par. 2: `Judge. => Judge.` . see: Sun Tzu Said:, on page 111.
- Par. 3: `=> 3 Judge. (故)` . Use of 故 as an elaboration rather than a Consequence, see: Constant Factors, on page 111.
- Par. 11: `2(Cond. => Conseq.)` , see: Constant Factors, on page 111.
- Par. 12: `=> Adv. (故)` . see: Deliberations, on page 113.
- Par. 13-14: `=> Conseq.` .

- Par. 15: `(2 (Cond. => Adv.)`. see: Deliberations, on page 113.
- Par. 16-17: `2 Adv.` see: Deliberations, on page 113.
- Par. 19-24: `(故), 14 (Cond. => Adv.)`. see: Deception, on page 113.
- Par. 26: `3(Cond. => Conseq.); Judge.`.

Chapter II

- Par. 1: `4 Cond. => Conseq.`.
  Universal quantification 凡 (fán): in the operations of war...see: Sun Tzu Said:, on page 129.
- Par. 2: `Cond. => 2 Conseq., Conseq. => Conseq.`.
  see: Duration, on page 130.
- Par. 3: `Conseq. => Conseq.`, as indicated by 则 (zé).
  see: Duration, on page 130.
- Par. 4: `4 Cond. => 2 Conseq.`, indicated by 则 (zé).
  see: Duration, on page 130.
- Par. 5-6: `=> 2 Judge. (故)`, both affirmed by 也 (ye).
  see: Duration, on page 130.
- Par. 7: `Cond. => Cond) (故)`. see: Skill, on page 131.
- Par. 8-9: `4 Adv. => Cond`, affirmed by 也.
  see: Skill, on page 131.
- Par. 10: `Cond. => Cond, Cond. => Conseq.`, indicated by 则.
  see: Prices, on page 132.
- Par. 11: `2(Cond. => Conseq.)`, indicated by 则.
  see: Prices, on page 132.
- Par. 12: `Cond. => Conseq.`, indicated by 则.
  see: Prices, on page 132.
- Par. 13-14: `Cond. => 3 Conseq.`.
  see: Prices, on page 132.
- Par. 15: `=> Adv. (故)`, followed by a justification.
  see: Prices, on page 132.
- Par. 16: `2(Cond. => Conseq.)`, reversed use of 也. see: Rewards, on page 133.
- Par. 17-18: `(Cond. => 4 Adv.) (故)`. see: Rewards, on page 133.
- Par. 19: `=> Judge. (故)`, used as a summary of previous text. see: Result, on page 133.
- Par. 20: `=> Judge. (故)`, 也 indicates the essence of this judgement.
  see: Result, on page 133.

Chapter III

- Par. 2: `=> 2 Judge. (故)`.
  see: Excellence, on page 148.

- Par. 3: `=> Judge. (故)`.
  The judgement is a preference order. see: Leadership, on page 148.
- Par. 4: `Adv.`.
  see: Leadership, on page 148.
- Par. 5: `Cond. => 3 Conseq.`.
  see: Leadership, on page 148.
- Par. 6: `=> 3 Adv. (故)`.
  The three actions are composite: **Cond. => Conseq.** where 也 indicates a reversed implication. see: Leadership, on page 148.
- Par. 7: `Conseq. => Conseq. (故)`.
  也 indicates the essence of the sentences. see: Leadership, on page 148.
- Par. 8-9: `6(Cond. => Adv.) (故)`.
  see: Rules in War, on page 150.
- Par. 10: `=> Judge. (故)`.
  see: Rules in War, on page 150.
- Par. 11: `(2(Cond. => Conseq.)`.
  see: Guardian, on page 151.
- Par. 12: `=> Judge. (故)`.
  see: Guardian, on page 151.
- Par. 13-15: `3(Cond. => Conseq.)`.
  see: Guardian, on page 151.
- Par. 16: `Cond. => Conseq.`.
  see: Guardian, on page 151.
- Par. 17: `5(Cond. => Conseq.) (故)`.
  see: Essentials for Victory, on page 152.
- Par. 18: `Judge.; 3(Cond. => Conseq.) (故)`.
  see: Hence the Saying:, on page 152.

Chapter IV

- Par. 3: `=> Judge. (故)`.
  see: Good Fighter, on page 162.
- Par. 4: `=> Judge. (故)`.
  see: Good Fighter, on page 162.
- Par. 5: `2(Cond. => Conseq.)`. Reversed indication by 也.
  see: Defensive and Offensive, on page 162.
- Par. 6: `2(Cond. => Cond)`.
  see: Defensive and Offensive, on page 162.
- Par. 7: `Judge. => Judge. (故)`.
  see: Defensive and Offensive, on page 162.
- Par. 10: `=> 3 Judge. (故)`.
  see: Excellent Victory, on page 163.
- Par. 12: `Judge. (故)`. 也 indicates the essence of the statement.
  see: Excellent Victory, on page 163.

- Par. 13: `(Cond. => Conseq.) (故)` .
  see: Excellent Victory, on page 163.
- Par. 14: `=> Judge. (故)` .
  see: Excellent Victory, on page 163.
- Par. 15: `2(Cond. => Conseq.), if-then-else construction, (故)` .
  see: Excellent Victory, on page 163.
- Par. 16: `2 Adv. => Conseq. (故)` .
  see: Military Method, on page 165.
- Par. 17-18: `5(adv. => Adv.)` . Enumeration followed by five reversed causal relations. see: Military Method, on page 165.
- Par. 19: `Judge. (故)` , The judgement is a metaphor.
  see: Military Method, on page 165.

Chapter V

- Par. 6: `=> Judge. (故)` .
  see: Direct and Indirect, on page 177.
- Par. 12-13: `2 Judge.` ;
  see: Circumstance, on page 180.
- Par. 14: `=> Judge. (故)` .
  see: Circumstance, on page 180.
- Par. 17-18: `6 (cond. => Conseq.)` (Reversed) 也.
  see: Order and Disorder, on page 180.
- Par. 19: `2 (Adv. => Coseq.) (故)` .
  see: Momentum, on page 182.
- Par. 20: `2 (Adv. => Conseq.)` .
  see: Momentum, on page 182.
- Par. 21: `2 (=> Judge. (故))` .
  see: Momentum, on page 182.
- Par. 22: `(Cond. => Conseq.)` ; Metaphor.
  see: Momentum, on page 182.
- Par. 23: `=> Judge. (故)` ; Metaphor.
  see: Momentum, on page 182.

Chapter VI

- Par. 1: `Universal quantification 凡; 2(Cond. => Conseq.)`
  see: Sun Tzu Said:, on page 196.
- Par. 2: `=> Judge. (故)` see: Time of Attack, on page 196.
- Par. 3: `2 (Cond. => Conseq.)` . see: Time of Attack, on page 196.
- Par. 4: `(Cond. => Conseq.) (故)` .
  see: Time of Attack, on page 196.

- Par. 5: `(Cond. => Adv.)` , reversed implication indicated by 也. see: Success of Attack, on page 197.
- Par. 6: `(Conseq. <= Cond.)` , reversed implication, indicated by 也). see: Success of Attack, on page 197.
- Par. 7: `(2 Conseq. <= Cond.)` , reversed implication, indicated by 也). see: Success of Attack, on page 197.
- Par. 8: `=> 2 Judge. (故)` . see: Success of Attack, on page 197.
- Par. 9: `=> 3 Judge. (故)` . see: Success of Attack, on page 197.
- Par. 10: `2(Adv. => Conseq.)` (reversed implication, indicated by 也). see: Success of Attack, on page 197.
- Par. 11: `3 (Cond. => Conseq.)` (故) (reversed implication, indicated by 也). see: Fighting, on page 198.
- Par. 12: `3 (Cond. => Conseq.)` (reversed implication, indicated by 也) see: Fighting, on page 198.
- Par. 13: `(Cond. 2 (Conseq. <= Cond), Judge.)` (故), reversed implications. see: Fighting, on page 198.
- Par. 15: `Cond. => Conseq.` . see: Fighting, on page 198.
- Par. 16: `Cond. => 3 Conseq.` . see: Place of Attack, on page 199.
- Par. 17: `=> 5(Cond. => Conseq.) implicated by (故)` . see: Place of Attack, on page 199.
- Par. 18: `2(Conseq. <= Cond.)` (reversed implication, indicated by 也). see: Place of Attack, on page 199.
- Par. 19: `Cond. => Conseq.(故)` . see: Place of Attack, on page 199.
- Par. 20: `Cond. => (4 Conseq., Judge.)` . see: Place of Attack, on page 199.
- Par. 21: `(Cond. => (Conseq., Adv.)) (故)` . see: Tactical Dispositions, on page 200.
- Par. 22: `(Cond. => (Conseq., Adv.)) (故)` . see: Tactical Dispositions, on page 200.
- Par. 23: `2 Adv.` . see: Tactical Dispositions, on page 200.
- Par. 24: `Cond. => Conseq.` . see: Tactical Dispositions, on page 200.
- Par. 28: `Adv.` . see: Tactical Dispositions, on page 200.
- Par. 33: `Cond. => Conseq.` . see: The Way in War, on page 201.
- Par. 34: `=> complex Judge. (故)` . see: The Way in War, on page 201.

Chapter VII

- Par. 1 `Universal quantification 凡, Judge.` see: Orders, on page 218.
- Par. 2: `Cond. => Adv.` see: Orders, on page 218.
- Par. 4: `=> Judge. (故)`; see: Maneuvering, on page 219.
- Par. 5: `=> Judge. (故)`; see: Maneuvering, on page 219.
- Par. 6: `2 (Cond.. => Conseq.)` see: Maneuvering, on page 219.
- Par. 7-8: `(4 Cond. => 4 Conseq.) (故)` see: Maneuvering, on page 219.
- Par. 9: `Cond. => 2 Conseq.` see: Maneuvering, on page 219.
- Par. 10: `Cond. => Conseq.` see: Maneuvering, on page 219.
- Par. 11: `Judge. (故)` see: Maneuvering, on page 219.
- Par. 12: `Conseq. <= Cond.; (故)` see: Maneuvering, on page 219.
- Par. 13: `Conseq. <= Cond.`;. see: Maneuvering, on page 219.
- Par. 14: `Conseq. <= Cond.` see: Maneuvering, on page 219.
- Par. 15: `=> Judge., Adv.` (故) see: Maneuvering, on page 219.
- Par. 16: `Cond. => Adv.` 也 indicates a reversed implication. see: Maneuvering, on page 219.
- Par. 17: `=> Judge. (故)` see: Maneuvering, on page 219.
- Par. 18-19: 4 metaphors see: Maneuvering, on page 219.
- Par. 20-21: `3 (Cond. => Adv.)` see: Maneuvering, on page 219.
- Par. 22: `Cond. <= Conseq.`; 也 indicates the essence of the sentence, and the implication is reversed. see: Maneuvering, on page 219.
- Par. 23: `2 (Cond. => Adv. (故))` see: Circumstances, on page 223.
- Par. 26: `2(Cond. => Adv.) (故)`; see: Circumstances, on page 223.
- Par. 27: `=> Judge. (故)` see: Circumstances, on page 223.
- Par. 28: `=> 3 Judge. (故)` see: Circumstances, on page 223.
- Par. 29: `2(Cond. => Adv.)` (故) see: Circumstances, on page 223.
- Par. 33-35: `=> Judg. (故)`; the judgement involves several do nots. see: Circumstances, on page 223.
- Par. 36: `Cond. => Adv.`; The advice includes a list of negative items (for example: Not to advance uphill against the enemy ...). see: Circumstances, on page 223.

Chapter VIII

- Par. 1 `Universal quantification 凡, Judge.` see: Circumstance, on page 236.
- Par. 2: `(5 Cond. => Adv.)`, see: Variations, on page 237.
- Par. 3: Five negative instructions, see: Variations, on page 237.
- Par. 4-5: `2 (Cond. => Conseq. (故)`, if-then-else construction. see: Variations, on page 237.

- Par. 6: `(2 Cond. => Conseq.)` , see: Variations, on page 237.
- Par. 7: `=> Judge. (故)` , see: Variations, on page 237.
- Par. 8-9: `2 (Cond. => Conseq.)` , see: Variations, on page 237.
- Par. 10: `=> Judge. (故)` , see: Variations, on page 237.
- Par. 11: `=> Judge. (故)` , see: Variations, on page 237.
- Par. 12: `=> Judge. (故)` ; 也 closes a definition (5 x), see: Five Dangerous Faults, on page 238.
- Par. 14: `Cond. => Adv.` ; reversed but not indicated by 也, see: Five Dangerous Faults, on page 238.

Chapter IX

- Par. 1 Universal quantification 凡
- Par. 2 也 indicates the essence of the sentence, see: Four Useful Branches of Military Knowledge, on page 255.
- Par. 3: `Cond. => Adv.` ; see: Four Useful Branches of Military Knowledge, on page 255.
- Par. 4: `Cond. => 2 Adv.` ; see: Four Useful Branches of Military Knowledge, on page 255.
- Par. 5-6: `(Cond. => Adv. , Adv., Adv.);` 也 indicates the essence of the sentence, see: Four Useful Branches of Military Knowledge, on page 255.
- Par. 7-8: `Cond. => 3 Adv.` ; 也 indicates the essence of the sentence, see: Four Useful Branches of Military Knowledge, on page 255.
- Par. 9: `Cond. => Adv.` ; 也 indicates the essence of the sentence, see: Four Useful Branches of Military Knowledge, on page 255.
- Par. 10 Universal quantification 凡; 也 indicates the essence of the sentence, see: Four Useful Branches of Military Knowledge, on page 255.
- Par. 11 Universal quantification 凡, see: Preferences, on page 258.
- Par. 12: `2 Adv. => 2 Conseq` , see: Preferences, on page 258.
- Par. 13: `Adv. => Conseq.` ; closed by 也, see: Terrain Type, on page 258.
- Par. 14: `Cond. => Adv.` ; closed by 也, see: Terrain Type, on page 258.
- Par. 15-16: `Cond. => - Adv.` ; closed by 也, see: Terrain Type, on page 258.
- Par. 17: `Cond. => 3 Adv.` ; closed by 也, see: Neighborhood, on page 259.
- Par. 18-38: A series of reversed implications, indicated by 也, see: Circumstances, on page 259.
- Par. 39: `Cond. => Judge.` , see: Circumstances, on page 259.
- Par. 40: `Cond. => Judge.` ; affirmed by 也, see: Commanding, on page 263.
- Par. 41: `Cond. => Conseq.` , see: Commanding, on page 263.
- Par. 42: `Cond. , Adv. => Cond. , Judge.` ; affirmed by 也; `Cond, - Adv. => Judge.` ; affirmed by 也, see: Commanding, on page 263.
- Par. 43: `=> Judge. (故)` , see: Commanding, on page 263.

- Par. 44: `(Adv. | Conseq. | Conseq.)`, see: Commanding, on page 263.
- Par. 45: `2 Adv. => Judge.`;
  affirmed by 也, see: Commanding, on page 263.

Chapter X

- Par. 1 者 used as bound variable, see: Sun Tzu Said:, on page 279.
- for par. 2-13 see see: Terrain, on page 279.
  - Par. 2-3: `Def., Cond. => (2 Adv., Conseq.)`;
  - Par. 4-5: `Def., if-then-else: (Cond. => Adv., 2 Cond. => Conseq.)`;
  - Par. 6-7: `Def., 2 Cond. => Adv., Cond. => Adv.`;
  - Par. 8: `=> 2 Adv.`;
  - Par. 9: `if-then-else: 2 Cod. => Adv.`
  - Par. 10: `Cond. => 2 Adv.`;
  - Par. 11: `Cond. => 3 Adv.` ;
  - Par. 12: `2 Cond. => 2 Judge.`;
  - Par. 13: Universal quantification 凡;
- For par. 14-20 see see: Calamities, on page 281.
  - Par. 14: `=> Judge. (故)`; Universal quantification with 凡
  - Par. 15: `2 Cond. => Conseq.`;
  - Par. 16: `2 (Cond. => Conseq.)`
  - Par. 17: `(Cond, Conseq. => Conseq.)`
  - Par. 18: `4 Cond. => Conseq.`
  - Par. 19: `(Cond, 3 Adv. => Conseq.)`
  - Par. 20 Universal quantification with 凡;
- Par. 22: `(Cond. | Conseq. | Conseq.)`, see: Good Commander, on page 284.
- Par. 23: `(Cond. => Adv., Adv.) (故)` (reversed indicated by 也), see: Good Commander, on page 284.
- Par. 24: `=> Judge. (故)`; 也 indicates the essence of the sentence, see: Good Commander, on page 284.
- Par. 25: `2 (Adv. => Conseq.) (故)`, see: Authority, on page 285.
- Par. 26: `3 Cond. => Cond. ; Judge.` 也 indicates the essence of the sentence, see: Authority, on page 285.
- For par. 27-31, see: Way to Victory, on page 286
  - Par. 27: `2 Cond. => Judge.`
  - Par. 28: `2 Cond. => Judge.`
  - Par. 29: `3 Cond. => Judge.`
  - Par. 30: `=> CompJud[ 2 (Conseq. => Cond) ] (故)`
  - Par. 31: `=> CompJud[ 2 (Cond. => Conseq.) ] (故)`

Chapter XI-I

- Par. 11-14: `=> 9 (Cond. => Adv.) (故)`, see: Nine Varieties of Ground, on page 301.
- For par. 15-18, see: Skillful Leaders, on page 301.
  - Par. 16: `Cond. => Conseq.`;
  - Par. 17: `2 (Cond. => Adv.)`, if-then-else construction
  - Par. 18: `Cond. => Adv.`
- For par. 20-29, see: Invading Army, on page 302.
  - Par. 20: `Cond. => Conseq.`; Universal quantification 凡
  - Par. 23: `Adv. => Conseq., Cond. => Conseq.`
  - Par. 24: `4 (Cond. => Conseq.)`
  - Par. 25: `=> 4(Cond. => Conseq.) (故)`; the conditions are negated.
  - Par. 26: `2 Adv. => Conseq.`
  - Par. 27: `2 (Cond. => Cond)`; both conditions are negated, reversed, indicated by 也.
  - Par. 28: `Cond. => Conseq.`; 也 indicates the essence of the sentence.

Chapter XI-II

- For par. 29-34, see: Skillful Commander, on page 320.
  - Par. 29: `=> Judge. (故)`; the judgement is a metaphor including `3 (Cond. => Conseq.)`
  - Par. 30: `Cond. => Adv. ; Cond. => Conseq.`;
  - Par. 31: `=> Judge. (故)`;
  - Par. 34: `=> Judge. (故)`;
- Par. 35-36: `3 Adv. => Conseq.`, see: Business of a Commander, on page 320.
- Par. 37: `2 (Adv. => Conseq.)`, see: Business of a Commander, on page 320.
- Par. 42: `2 (Cond. => Conseq.)`; Universal quantification 凡, see: Hostile Territory, on page 321.
- Par. 43-45: 6 Definitions; 者 used as bound variable, see: Hostile Territory, on page 321.
- Par. 46-50: `9 (Cond. => Adv.) (故)`, see: Rules for Types of Ground, on page 322.
- Par. 51: `3 (Cond. => Adv.) (故)`, see: Rules for Types of Ground, on page 322.
- For par. 52-55, see: Rules of Communication, on page 322.
  - Par. 52: `3 (Cond. => Conseq.) (故)`
  - Par. 54: `Cond. => 3 Conseq.`
  - Par. 55: `3 Adv. => Conseq. (故)`
- Par. 56: `2 Adv. => Cond`, see: Rewards, on page 324
- For par. 57-59, see: Communication with your Army, on page 324.
  - Par. 57: `2(Cond. => Adv.)`, if-then-else construction.
  - Par. 58: `2(Adv. => Conseq.)`

  - Par. 59: `Cond. => Conseq.`
- For par. 60-68, see: Success in Warfare, on page 325.
  - Par. 60: `=> Judge. (故)`
  - Par. 61: `Adv. => Conseq.`
  - Par. 63: `Cond. => 3 Adv. (故)`
  - Par. 65: `Conseq. => Adv.`
  - Par. 66-68: `6 Adv. => Conseq. (故)`

Chapter XII

- Par. 1: Universal quantification 凡
- For par. 6-13, see: Variations, on page 339.
  - Par. 6: `Cond. => Adv.`
  - Par. 7: `Cond. => Adv.`
  - Par. 8: `2 (Cond. => Adv.)`, if-then-else construction.
  - Par. 9: `Cond. => 2 Adv.`
  - Par. 10: `Cond. => 2 Adv.`
  - Par. 12-13: `=> Judge. (故)`;
- Par. 15: `Cond. => Conseq.`, see: Enlightened Ruler, on page 340.
- Par. 16: `=> Judge. (故)`, see: Enlightened Ruler, on page 340.
- Par. 17: `3 (Cond. => Adv.)`; both condition and advice are negated. see: Enlightened Ruler, on page 340.
- Par. 19: `2(Cond. => Adv.)`, if-then-else construction, see: Commanding, on page 341.
- Par. 22: `=> Judge. (故)`; 也 indicates the essence of the sentence, see: Keeping Peace, on page 341.

Chapter XIII

- Par. 1: `Cond. => 6 Conseq.`. see: Sun Tzu Said:, on page 356
- Par. 2: `4 Cond. => Judge.`; see: The Reason to Use Spies, on page 356.
- Par. 3: `Cond. => 3 Conseq.`; see: The Reason to Use Spies, on page 356.
- Par. 4: `=> Judge. (故)`; see: The Reason to Use Spies, on page 356.
- Par. 5-6 `Judge.`. see: Foreknowledge, on page 358.
- Par. 7: `=> Conseq. (故)`; the consequence is an enumeration. see: 5 Classes of Spies, on page 358.
- Par. 8: `Judge.`; see: 5 Classes of Spies, on page 358.
- Par. 9-13: `5 Def.` 者 (a person involved in…) is used as bound variable ; see: 5 Classes of Spies, on page 358.
- Par. 14: `=> 3 Adv. (故)` see: Using Spies, on page 359.

- Par. 15-17: `2(Conseq. <= Cond.) , Cond. => Conseq.` . All conditions are negated. see: Using Spies, on page 359.
- Par. 18: `Adv.` . see: Using Spies, on page 359.
- Par. 19: `Cond. => 2 Adv.` see: Security Breach, on page 360.
- Par. 20: `3 Cond. => 5 Adv.` see: Information, on page 360
- Par. 21: `3 Adv. => Conseq. (故)` ; see: Converted Spies, on page 361
- Par. 22-24: `3 (Cond. => Conseq). (故)` ; see: Converted Spies, on page 361
- Par. 25: `Judg., 2 Cond. => Conseq. (故)` ; see: Converted Spies, on page 361
- Par. 27: `2 Conseq., 2 Judge. (故)` ; see: Enlightened Ruler, on page 362 and see: Conclusion, on page 363

Part IV

Miscellaneous Subjects

This part has an overview of translations of *Sun Tzu, the Art of War*, an overview of the terrains used.

Translations of The Art of War

Abstract This chapter shows an overview of the various translations we found of “The Art of War” into English and some other western languages.

Editions and Translations of Sun Tzu, The Art of War

The Chinese mind maps in this book are based on the text as delivered from the Song dynasty era as included in the seven military classics of Ancient China. We use the translation into English by Lionel Giles, one of the oldest translations, made in 1910. This text is available as part of the Gutenberg project [24] and is therefore freely available without copyright restrictions. Although there are later translations based on more modern research and on Chinese texts that were found during later excavations, notably in 1972, we think that the Giles translation is most suitable for our purpose: the translation is highly structured and because of its unrestricted availability we can transform the text to highlight this structure, and the rules behind it. We consulted newer translations to check that our understanding of the text is not completely dependent on the Giles translation.

In some locations where the discrepancy with the Chinese source text would have affected the logical structure of the mind maps we have adapted the translation in order to preserve the structure.

The history of the translations is interesting in itself, because most translators seem to be of the opinion that they improved significantly on what their predecessors did.

- The first known translations, dating from the Medieval era, are in Asiatic languages (Tibetan, Japanese and Manchu); we have not consulted these texts.
- The oldest known translation in a European language dates from 1772: the French Jesuit Jean Joseph Marie Amiot produced an edition of the seven military classics of Ancient China [2]. It is not a verbatim translation, as observed by Mair [46]. Amiot mixed commentaries and his own ideas with the text. A recent edition of this translation was produced by Yann Couderc [3]. He presents a extended history of Amiot’s text, and also explains how to discriminate between the true text of Amiot, and the many editions produced recently which are based on translations made in France around 1970.

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- The first known translation into English was done by Captain E.F. Calthrop in 1905, with improvements in 1908 [13]. This edition was produced however from a Japanese source, so it is an indirect translation.
- Lionel Giles must be the second translator, motivated to do this translation because he thought that the translation by Calthrop was *excessively bad* [23].
- Giles has abundant notes and explanations in his text.
- It would take about 50 years before another translation was made by Samuel B. Griffith [26].

The translations which we have consulted were done by:

Table 1 Translations

Author	**Date**	**Reference**
Griffith	1963	[26]
Cleary	1988	[15, 16]
Ames	1993	[1]
Sawyer	1994	[57, 59]
Wu Rusong	1999	[56]
Minford	2002	[50, 51]
Lin Wusun	2003	[78]
Mair	2007	[46]
Huynh	2008	[33]
Denma	2009	[19]
Zieger	2010	[82]
Trapp	2012	[68]
Harris	2018	[29]

Recently an illustrated comic edition was produced by Brian Brya and Tsai (2018) [11]. We encountered some more curious editions:

- Maya Mai uses the text as exercise material for left-handed handwriting [44].
- In 2020, we obtained an edition in Italian by a translator named Matteo Ricci [55]. If this refers to the late 16-the century Jesuit who lived in China around 1600, this would predate the Amiot edition by almost 200 years. We could, however, not find any indication in biographies of Matteo Ricci that he has produced such a translation, so we assume it is an instance of the classic Chinese tradition of ascribing literary works to famous authors.
- Another curious edition has been produced by David G. Jones [32], who defends a theory that Sun Tzu is not a book on War at all. He claims that it was produced around 250 BCE in Qin as a theoretical text for achieving the unification of China by peaceful means under the first Qin emperor Qin Shih Huangdi, based on the Legalist philosophy. He also claims that the collection of dialogues Chang-kuo Ts'e [18], which was recorded by Liu Hsiang during the Han dynasty represent the practical implementation of his strategy: how to convince rules of nighbouring states to stop warring and join the glorious Qin empire instead. Having achieved this unification, the first emperor failed to organize his succession, and the resulting lack of leadership resulted into a Confucian counterrevolution leading to the Han dynasty; history was rewritten, turning Qin Shih Huangdi into a cruel warlord, and the Sun Tzu text into a book about warfare. In his edition Jones attempts to recover the original intent by rephrasing the entire text, but with little respect to the Chinese source text.

The translations are substantially different, and it is difficult to decide whether the exact concepts from the old text are used. Moreover, the source text is of course written in ancient Chinese, yielding additional problems, also for modern native Chinese scholars.

We provide here some additional remarks on the various editions (for references see table 1):

- The editions of Ames, Lin Wusun, Trapp, Brian Bruya and Ricci include the Chinese text aside the translation. The other editions don't include the Chinese source.
- The editions of Griffith and Brian Bruya have omitted some sections.
- The editions of Minford and Denma present the translation as a poem.
- Giles and Harris present first the pure translation and subsequently repeat the translation including commentaries from the classical 11 Chinese commentators, adding short biographical information on these 11 commentators.
- Amiot, Griffith, and Cleary have added some text of the classical commentators in their translation.
- The size of the introductory part ranges from virtually absent (Trapp) to extensive (Ames, Sawyer, Mair and Denma).
- Griffith, Sawyer and Harris focus on aspects of Military History; others more on general history and philosophical aspects.
- Zieger's edition is unique, because he aims for a character to word translation, in order that each character is always translated by the same phrase.
- Mair presents extensive details on the history of the text and its translations, including a table with probable dating of the 13 chapters over a period of 74 years (345 B.C. until 272 B.C.). This is also the unique edition in which logical aspects like the use of the character 故 (gù, therefore) in illative conjunctions are described. And Mair has made an attempt of debunking the urban legend that Napoleon has read the Amiot edition.
- Connecting these editions with actual history are the prefaces by contemporary generals is done by: B.H. Liddell Hart in the edition of Griffith and David H. Petraeus in the translation of Harris.
- There is a curious remark by Giles, who considers it likely that knowledge about Sun Tzu's ideas actually have reached the Roman empire.

Finding the right meaning and translate it the right way remains tricky, as is illustrated by three different translations of a famous sentence in chapter 4:

- From the Computer Game "Civilization IV", Military Tradition splash screen:

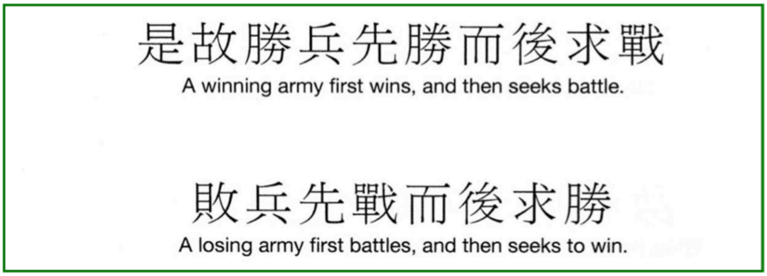
  > Victorious warriors win first and then go to war, while defeated warriors go to war first and then seek to win.

- From the translation of Andrew W. Zieger:

  > A winning army wins first and then seeks battle. A losing army first battles, and then seeks to win.

  See also the figure below, to view the original Chinese text. Note that the Chinese text actually starts with *therefore*.
- From Lionel Giles, Ch. IV, par. 15:

```
15. Thus it is that in war
  » the victorious strategist only seeks battle after
    the victory has been won,
  » whereas he who is destined to defeat first fights
    and afterwards looks for victory.
```



是故勝兵先勝而後求戰

A winning army first wins, and then seeks battle.

敗兵先戰而後求勝

A losing army first battles, and then seeks to win.

A winning army, excerpt of the translation by Andrew Zieger.

We can conclude from these examples that the word *bing* has been translated to single soldier, commander or the whole army. It can also mean weapons, or military. The use of the translation *warrior* in this context only appears in the Cleary edition [15] where it occurs in a commentary to the final sentence of chapter 1, ascribed to Zhang Yu, a commentator who lived during the Sung Dynasty (960-1279 AD). Therefore, the quote in the Civilization IV game is actually a quote of an ancient commentator, and not of Sun Tzu himself. In Liu An [34], section 15.8, we find a similar sentence about soldiers.

Another example is the judgement on a possible stupidity of the commander in chapter 9, 37. We present some translations here:

- From Giles:

  > To begin by bluster, but afterwards to take fright at the enemy's numbers, shows a supreme lack of intelligence.

- From Griffith:

  > If the officers at first treat the men violently and later are fearful if them, the limit of indiscipline has been reached.

- From Sawyer

  > One who is at first excessively brutal and then fears the masses is the pinnacle of stupidity.

- From Lin Wusun

  > When the commander erupts violently at his subordinates only to be afraid of them later, he is totally inept.

- From Minford

  > If a general is by turns tyrannical and in terror of his own men, it is a sigh of supreme incompetence.

- From Zieger

  > When at first they are savage, but then terrified, the troops have lost their spirit.

These translations disagree on who gets scared (the troops or the commander) and whom they are fearing (the enemy of their own troops). These issues have extensively been debated by the ancient commentators as well.

The diversity in translations is particularly problematic in the use of terminology; typical examples are the terms used for the terrain types in chapter 8, 10 and 11 , and the disasters in chapter 10. For these concepts we have selected a term which we felt to be the closest to the Chinese original.

A comprehensive discussion of the diversity of six translations is given by Yang Ming [36].

Why does English force one to embroider the Chinese text into a story?
As we argued earlier in this chapter, in early times text like this was spoken aloud. A rhythmic text with repeating of words helps to convey its meaning. Today readers seam to favor a story-like text, but we believe that this actually harms the understanding of the text. Therefore, we tried to bring some rhythm back.

Terrain

Abstract In Sun Tzu's book there are several enumerations of terrain types, mainly in AoW Chapters. VIII, IX, X and XI,. Sun Tzu provides advice and rules for these types of terrain.

The Art of War and the Use of Terrain

There are four chapters: Ch. VIII, IX, X and XI, in the AoW, where types of *terrain* and what to or not do in various circumstances, is an important subject. We describe in this chapter more about the terrain types and what it means for warfare. We do this by quoting the structured text, rather than showing the mind map fragments, because we hope that they are easier to read and the structured text is directly generated from the mind maps, which therefore should show the same content in a similarly structured way.

We realize that there is a certain amount of duplication in the way we quote parts of the text, but just referencing to the mind map fragments or structured text parts, makes it very hard to get an overview.

According to Mair [46] on pag. 29, these chapters are the oldest parts of the book, in this order: 9 (345 B.C.), 10, 8, 11 (330 B.C.). Mair assumes that at first *The Art of War* was a practical text, to be used in practical situations, such as describing what to do in various circumstances concerning terrain. The strategic and planning parts of the book would appear later.

The tables we show here: Terrain Terminology, on page 404, contain the terminology as used by Giles, the terminology used in this book, and in case these are not the same, we show from which source we took the term.

Chapter VIII, Nine Variations

This chapter lists, in paragraph 2, some circumstances a commander might find himself in. Sun Tzu does not explicitly enumerate them, but we counted 5 types.

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Then, in paragraph 3, five things are listed that must *not* be done, of which 3 are related to terrain: *roads, towns* and *positions*. There is no explanation which type of roads must not be followed, or towns that must not be besieged, but in later chapters we find more information.

Here is the structured text for this piece:

```
[The Five Circumstances]
  » [5 Types of Country]
    ° When in difficult country,
      - do not encamp.
    ° In country where high roads intersect,
      -  join hands with your allies.
    ° in dangerously isolated positions.
      - Do not linger
    ° In encircled situations,
      - do resort to stratagem.
    ° In desperate position,
      -   fight.
  » [5 Do Nots]
    ° 3. There are:
      - roads which must not be followed,
      - armies which must be not attacked,
      - towns which must not be besieged,
      - positions which must not be contested,
      - commands of the sovereign which must not be
        obeyed.
```

The mind map details can de found in figure: Variations, on page 237

Chapter IX, The Army on the March

The first paragraph of Ch. IX exactly sums up what this rather long chapter is about, the question of *encamping the army*, and *observing signs of the enemy.*

In the section **Four Useful Branches of Military Knowledge** that Sun Tzu mentions in paragraphs 1-10, we encounter warfare in these terrain types: Mountain Warfare, River Warfare, Warfare in Salt-Marshes, Warfare in Flat Country. The details can be found in section: Four Useful Branches of Military Knowledge, on page 255.

```
[Mountain Warfare]
  » Pass quickly over mountains,
  » and keep in the neighborhood of valleys.
  » 2. Camp in high places, facing the sun.
  » Do not climb heights in order to fight.
[River Warfare]
  » 3. After crossing a river, you should get far away
    from it.
  » 4. When an invading force crosses a river in its
    onward march,
    ° do not advance to meet it in mid-stream.
    ° It will be best to let half the army get across,
      - and then deliver your attack.
  » 5. If you are anxious to fight,
    ° you should not go to meet the invader near a
      river which he has to cross.
    ° 6. Moor your craft higher up than the enemy,
      - and facing the sun.
    ° Do not move up-stream to meet the enemy.
[Warfare in Salt-Marshes]
  » 7. In crossing salt-marshes, your sole concern
    should be
    ° to get over them quickly, without any delay.
  » 8. If forced to fight in a salt-marsh,
    ° you should have water and grass near you,
    ° and get your back to a clump of trees.
[Warfare in Flat Country]
  » 9. In dry, level country,
    ° take up an easily accessible position
    ° with rising ground to your right and on your
      rear,
      - so that the danger may be in front,
      - and safety lie behind.
10. These are the four useful branches of military
knowledge  which enabled the Yellow Emperor to
completely defeat  four several sovereigns.
```

The mind map detail can be found here: Terrain Type, on page 258.

Later in this chapter we encounter a few more types of terrain:

```
[Hill or Bank]
  » 13. When you come to a hill or a bank,
    ° occupy the sunny side, with the slope on your
      right rear.
    ° Thus you will at once act for the benefit of your
      soldiers and utilize the natural advantages of the
      ground.
[Swollen River]
  » 14. When, in consequence of heavy rains up-country,
    ° a river which you wish to ford is swollen and
      flecked with foam,
      - you must wait until it subsides.
[Dangerous Ground]
  » 15. Country in which there are
    ° precipitous cliffs with torrents running between,
    ° deep natural hollows,
    ° confined places,
    ° tangled thickets,
    ° quagmires and crevasses,
  » should be left with all possible speed and not
    approached.
  » While we keep away from such places, we should get
    the enemy to approach them;
  » while we face them, we should let the enemy have
    them on his rear.
```

The mind map detail can be found here: Terrain Type, on page 258.

Chapter X, Terrain

This is the second of the three chapters (the others are Ch.VIII and XI), where terrain types are defined abstractly, in similar but not completely the same lists.

In this chapter the subject is *taking position* of the army, deciding whether to *engage in battle*, or *engaging with the enemy*. You can find the details and mind map fragments here: Structured Text, on page 288.

```
We may distinguish six kinds of terrain, to wit:(1)
Accessible ground; (2) entangling ground; (3) deadlocked
ground; (4) narrow ground; (5) precipitous ground; (6)
distant ground.
[Accessible Ground]
  » 2. Ground which can be freely traversed by both
    sides is called accessible.
  » 3. With regard to ground of this nature,
    ° be before the enemy in occupying the raised and
      sunny spots,
    ° and carefully guard your line of supplies.
    ° Then you will be able to fight with advantage.
[Entangling Ground]
  » 4. Ground which can be abandoned but is hard to
    re-occupy is called entangling.
  » 5. From a position of this sort,
    ° if the enemy is unprepared,
      - you may depart and defeat him.
    ° But if the enemy is prepared for your coming,
      - and you fail to defeat him,
        - then, return being impossible,
        - disaster will ensue.
[Deadlocked Ground]
  » 6. When the position is such that neither side will
    gain by making the first move, it is called deadlocked
    ground.
  » 7. In a position of this sort,
    ° even though the enemy should offer us an
      attractive bait,
      - it will be advisable not to stir forth,
      - but rather to retreat,
    ° when half of his army has come out,
      - attack will be advantageous.
[Narrow Ground]
  » 8. With regard to narrow ground,
    ° if you can occupy them first,
      - let them be strongly garrisoned
        - to await the advent of the enemy.
    ° 9. Should the army forestall you in occupying a
      pass,
      - do not go after him
        - if the pass is fully garrisoned,
      - but only
        - if it is weakly garrisoned.
[Precipitous Ground]
```

```
  » 10. With regard to precipitous ground,
    ° if you are beforehand with your adversary,
      - you should occupy the raised and sunny spots,
      - and there wait for him to come up.
    ° 11. If the enemy has occupied them before you,
      - do not follow him,
      - but retreat
      - and try to entice him away.
[Distant Ground]
  » 12. If you are situated at a great distance from
    the enemy,
    ° and the strength of the two armies is equal,
  » it is not easy to provoke a battle,
    ° and fighting will be to your disadvantage.
13. These six are the principles connected with Earth.
  » The Commander who has attained a responsible post
    ° must be careful to study them.
```

Although the title of this chapter is *Terrain*, the second part is not about specific terrain at all, but about calamities that can happen and about what is a good commander.

Chapter XI, The Nine Situations

AoW Ch.XI is the longest chapter in the book, and also one of the oldest (330 B.C.). It contains three lists of terrains, not completely alike. Commentators disagree whether the three lists, and their differences, are really intentional, or whether in later times text was erroneously put together.

The **first list** is like this:

```
The art of war recognizes nine varieties of ground:
  » (1) Dispersive ground;
    ° 2. When a chieftain is fighting in his own
      territory,
      - 11. fight not.
  » (2) light ground;
    ° 3. When he has penetrated into hostile territory,
      but to no great distance,
      - 11. halt not.
  » (3) contentious ground;
    ° 4. Ground the possession of which imports great
      advantage to either side,
      - 11. attack not.
  » (4) wide ground;
    ° 5. Ground on which each side has liberty of
      movement
      - 12. do not try to block the enemy's way.
  » (5) intersecting grounds;
    ° 6. Ground which forms the key to three contiguous
      states,so that he who occupies it first has most of the
      Empire at his command,
      - 12. join hands with your allies.
  » (6) heavy ground;
    ° 7. When an army has penetrated into the heart of
      a hostile country, leaving a number of fortified cities
      in its rear,
      - 13. gather in plunder.
  » (7) wasteland;
    ° 8. Mountain forests, rugged steeps, marshes and
      fens
      - --all country that is hard to traverse:
        - 13. keep steadily on the march.
  » (8) encircled ground;
    ° 9. Ground which is reached through narrow gorges,
      and from which we can only retire by tortuous paths, so
      that a small number of the enemy would suffice to crush
      a large body of our men:
      - 14. resort to stratagem.
  » (9) desperate ground.
    ° 10. Ground on which we can only be saved from
      destruction by fighting without delay,
      - 14. fight.
```

The structure of the text is very straightforward: first a name for the type of terrain, followed by a definition and finally advice.

The mind map detail can be found in figure: Nine Varieties of Ground, on page 302.

The **second list**, in paragraph 42-45, looks like this:

```
42. When invading hostile territory,
  » the commander principle is,
    ° that penetrating deeply
      - brings cohesion;
    ° penetrating but a short way
      - means dispersion.
[Ground of no Return]
  » 43. When you leave your own country behind, and
    take your army across neighborhood territory,
    ° you find yourself on ground of no return
[Intersecting Ground]
  » When there are means of communication on all four
    sides,
    ° the ground is intersecting.
[Heavy Ground]
  » 44. When you penetrate deeply into a country,
    ° it is heavy ground.
[Light Ground]
  » When you penetrate but a little way,
    ° it is light ground.
[Encircled Ground]
  » 45. When you have the enemy's strongholds on your
    rear, and narrow passes in front,
    ° it is encircled ground.
[Desperate Ground]
  » When there is no place of refuge at all,
    ° it is desperate ground.
```

The text mentions here *hostile territory*. It explains what type of hostile territory you can be in. It seems that the terrain types are defined again here, but with the intent to describe the situation of invading hostile territory. The mind map detail is here: Hostile Territory, on page 322.

The **third list** in AoW Ch.XI is the same as the first list. and it tries to give rules of engagement with the enemy now, which is different from the first list. The mind map part is in figure: Rules for Types of Ground, on page 323.

```
46. Therefore,
  » on dispersive ground,
    ° I would inspire my men with unity of purpose.
  » On light ground,
    ° I would see that there is close connection
      between all parts of my army.
  » On contentious ground,
    ° I would hurry up my rear.
  » On wide ground,
    ° I would keep a vigilant eye on my defenses.
  » On intersecting ground,
    ° I would consolidate my alliances.
  » On heavy ground,
    ° I would try to ensure a continuous stream of
      supplies.
  » On wasteland,
    ° I would keep pushing on along the road.
  » On encircled ground,
    ° I would block any way of retreat.
  » On desperate ground,
    ° I would proclaim to my soldiers the hopelessness
      of saving their lives.
    ° 51. For it is the soldier's disposition
      - to offer an obstinate resistance when
        surrounded,
      - to fight hard when he cannot help himself,
      - and to obey promptly when he has fallen into
        danger.
```

Comparisons in the Use of Terrain

The tables in the next sections, and the descriptions we have seen, allow us to compare the use of terrain in the various chapters.

AoW Ch.VIII seems to be a shortened version of what is described in Ch. X and XI. In Ch. VIII there just five types of terrain, while in Ch.X there are 6, and the lists in Ch.XI contain 9, 6 and 9 items respectively.

AoW. Ch.IX is odd, because it handles about warfare in various circumstances, while using more practical and less abstract terminology than is used in the other chapters.

AoW Ch.X handles 6 kinds of terrain, with the purpose of taking an advantageous position for encountering the enemy. AoW Ch. XI seems to be talking about *camping*, *invading*, and *fighting* in various circumstances.

Terrain Terminology

The tables that follow here show the terminology used by Giles [23], other translators and the term we chose to use in the mind maps.

These tables are a shortened and simplified form of a larger table, which lists all translations by the various authors whose books we consulted and where we made a more precise cowrelation of terminology used in the four AoW chapters discussing terrain. We will publish this table on the website [90].

Table 2 AoW Ch.VIII, Nine Variations

Chin.	**Chosen Term**	**Giles**	**Also Used By**
絕地	*dangerous isolated positions*	dangerous isolated positions	Giles
衢地	*where high roads intersect*	where high roads intersect	Giles
圮地	*difficult*	difficult	Giles, Ames, Cleary, Lin Wusun
圍地	*encircled*	hemmed-in	Giles
死地	*desperate*	desperate	Giles, Mair

Table 3 AoW Ch. X, Terrain, Paragraph 1

Chin.	**Chosen Term**	**Giles**	**Also Used By**
通地	*accessible ground*	accessible	Giles, Lin Wusun, Mair, Ames,
挂地	*entangling ground*	entangling	Giles, Ames, Minford
支地	*deadlocked ground*	temporizing	Minford
隘地	*narrow ground*	narrow passes	Giles, Harris
險地	*precipitous ground*	precipitous heights	Giles, Ames, Griffith, ...
遠地	*distant ground*	at great distance	Lin Wusun, Mair, Ames, Griffith, Minford

Table 4 AoW Ch. XI-1, The Nine Situations, Paragraph 1

Chin.	**Chosen Term**	**Giles**	**Also Used By**
散地	*dispersive*	dispersive	Giles, Lin Wusun, Griffith, Sawyer
輕地	*light*	facile	Zieger, Clarey, Minford, Sawyer
争地	*contentious*	contentious	Giles, Sawyer
交地	*wide road*	open	
衢地	*intersecting*	intersecting highways	
重地	*heavy*	serious	Zieger
圮地	*wasteland*	difficult	Zieger
圍地	*encircled*	hemmed-in	
死地	*desperate*	desperate	Mair

Table 5 Chapter XI-2, Paragraph 43-45

Chinese	**Chosen Term**	**Giles**	**Also Used By**
絕地	*land of no return*	critical	Lin Wusun
輕地	*light*	facile	Harris, Minford, Sawyer, Zieger
衢地	*intersecting*	intersecting highways	
重地	*heavy*	serious	Harris, Minford, Sawyer, Zieger
圍地	*encircled*	hemmed-in	Harris, Sawyer
死地	*desperate*	desperate	Mair, Trapp

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